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SOME EXPERIENCES IN THE SYMPTOMATOLOGY AND TREATMENT OF THE TOXEMIA OF PREGNANCY AS BASED ON THE STUDY OF 78 CASES.[1]

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The toxemia of pregnancy is as far as we know an autointoxication affecting pregnant women, the exact causes of which are as yet obscure. Apparently it arises from an incomplete metabolism of certain food elements, although other causes, such as pressure on the kidneys and ureters, microörganisms, syncytial growths, thyroid, hepatic, renal, or intestinal intoxication, have been given as causes, and no doubt any or all of these do play a part as causal factors.

Chronic gastrointestinal indigestion, gout, overfeeding or the reverse, starvation, the overuse of alcoholic stimulants, tea and coffee, sudden grief, worriment, all act as predisposing causes.

A not uncommon predisposing cause seems to be a sudden chilling of the skin of a pregnant woman by exposure to cold and damp, the patient previously not having been excreting well.

It would seem probable that the fetus or its appendages, or both, have some causative relation to the production of the condition.

Symptoms.—In the records of 78 cases, the average time of most frequency was between 7½ and 8½ months.

Recently I have treated a well-marked case, the symptoms beginning at the twelfth week. As the symptoms have almost become classical I need only touch upon them. Headache I have found present in the majority of patients treated. This headache is usually frontal, and may be so slight as scarcely to be noticed, or may be severe. It is frequently accompanied by spots of light or sparks before the eyes, and dizziness. In one of my cases there was actual hallucination, the patient complaining of seeing the figure of a woman. Many patients complain of a feeling of "constant burning distress" beneath the sternum.

Occasionally in severe cases there is failing vision, with retinal hemorrhage. There is usually some change in the mental or general nervous state. The patient may be irritable or dull, sometimes both. Nōises frequently disturb her; little irritations which would not in the normal state annoy her at this time are much magnified. She may be morose, and upon slight cause wild attacks of temper may ensue. Mania and actual delirium sometimes follow. The skin is apt to be dry and the color muddy or slightly jaundiced. Occasionally skin eruptions appear. Marked jaundice in our experience has been a rare symptom, indeed I have only seen it twice; one of these cases recovered under treatment, the other had acute yellow atrophy of the liver and died. I have not been able to demonstrate

[1]Read before the Kensington Branch of the Philadelphia County Medical Society, Feb. 2, 1907.

any constant changes in the size of the liver as based on external examination. Occasionally the organ was slightly enlarged.

The bowels are usually constipated; frequently the patient will tell you she has a stool every day, possibly several of them, but they are small, and examination of the colon will usually demonstrate that it is far from empty. The bowel movements are often composed of small, hard, brownish lumps, sometimes a semiliquid stool, with considerable mucus. Flatulence will sometimes cause pain in the abdomen and may lead the patient to believe that labor is coming on. Rarely, very rarely, is the intestine actually emptied except by purgatives and lavage, and the natural movements are only a core of feces, the greater part remaining firmly attached to the walls of the bowel. High vaginal examination of the rectum, through the posterior vaginal wall or the rectum itself high up, will frequently demonstrate this fact.

The frequent examination of the urine is of the utmost importance; this has been recently made of still greater interest by the investigations of Williams and others of the ratios between the excretion of urea and other nitrogenous compounds, ammonia and its combinations. The total quantity in the 24 hours is not diminished. The specific gravity is lower than normal, the total excretion of solids decreased; but here we must not rely on the results of one or two examinations, but must make comparison between the solids in as large a number of specimens from the same individual as possible. In fact the urine should be examined every day if possible, and at least twice a week; the latter during a normal pregnancy, while during an attack of toxemia a daily examination should be the rule. The diet of the patient, the amount of fluids she is drinking, and many other things must be taken into account.

It is very unsafe to say that a patient is or is not excreting a normal or low amount of solids simply from one or two examinations. The urine should be carefully studied all through the attack, and then on all through her pregnancy, and for at least ten days after delivery. Albumin is frequently found in varying quantities. Specimens of albuminous urine should be sent to proper laboratories for differentiation of the albuminous deposit when the physician has not the time or facilities for making these examinations himself. Where casts are present and are persistent, and where dropsy and other nephritic symptoms complicate the case, it would show either that the kidneys were feeling the effect of the toxicity of the blood or that the patient had a nephritis preceding her pregnancy. Our experience has taught us that a patient may be distinctly toxemic for some time and yet show no albumin at all, although this is rare. One young primipara whose urine I had examined once or twice a week up to the eighth month showed no albumin at all, and yet she was suffering from toxemia all the time. I then omitted examinations for two weeks because she did not bring specimens to my office. She went into labor at 8½ months, and while in labor developed eclampsia, from which she recovered, although the child was lost. During the eclampsia she had plenty of albumin in her urine. Sugar is not usually present unless it be a trace of lactose; evidences of glycosuria would point to diabetic complications.

The amount of urea is decreased in toxemia, and here also the results of a few examinations, and without a careful study of the total solids excreted and their composition and proportions, will give little information of importance. Many facts must be taken into account in the study of the urea excretion: the diet, the amount of fluids taken, the normal urea index of the patient. Some persons excrete a larger amount of urea than others. I have now records of one series which at present sum up over 2500 examinations of the urine of pregnant patients; so far I have not been able to prove to my own satisfaction that the amount of urea excreted in pregnancy is materially less than in the non-pregnant state. I think a percentage of 1.25 would be a fair average normal for a pregnant woman. I have often seen it run less for weeks and yet the patient would be excreting well. When, however, it drops suddenly far below one per cent there is usually dan-

ger. Probably in these cases the amount of free ammonia in the urine would be found to be much increased. I have had no experience as yet in testing for these ammonia compounds as recommended by Williams, and I am glad the society has asked Dr. Foulkrod to be present to give us the benefit of his very considerable experience along this line.

The heart action is increased in toxemia. There may be an increased second sound. The pulse tension I believe is always or nearly always much increased.

I have not been able to demonstrate any marked leucocytosis above that of normal pregnancy, and I have had no experience in testing the toxicity of the blood on animals. I have not been able to demonstrate any constant or long-continued rise of temperature in patients suffering from the toxemia of pregnancy unless eclampsia develops. Occasionally I have noticed a rise to 100° or 101° F., but this did not continue for more than a day or two. The tongue is coated with a brownish coat and the breath is sometimes offensive.

It seems to me that as we review the symptoms of this condition we are struck with the similarity between them and a prolonged attack of intestinal indigestion; and yet the toxemia of pregnancy is more than that. Its symptoms differ quite markedly from uremia, and in most instances the urinary findings are quite different. We believe that the toxemia of pregnancy is a distinct pathological condition, and unrelieved by treatment is most dangerous to both mother and child. Its most common termination when not relieved by treatment is those convulsive seizures known as eclampsia. It is the cause of eclampsia. In other instances it causes pernicious nausea, and in still rarer instances acute maniacal seizures, as in a case reported by Davis of this city. What we may call a form of chronic intoxication accompanied by fever and without convulsions may be seen and is to be differentiated from septicemia. This diagnosis is often very difficult, however. Septicemia is most often seen after delivery; the microscopic and bacteriological examination of the blood and of any discharge and examination of the pelvic organs would aid in the diagnosis, especially when supplemented by a thorough and scientific examination of the urine. Personally with all these aids I have sometimes found the differential diagnosis quite difficult.

Treatment.—The treatment of the toxemia of pregnancy is based on efforts to increase elimination, first of all by the bowels. Purgation should be started and continued until the bowels are absolutely clean and a good flow of that natural intestinal antiseptic, the bile, is started. For this purpose calomel given in doses of ¼ grain every hour until 10 grains are taken, and often combined with one-fourth to one-half a drop of croton oil, and followed by the free use of salines, gives in our experience the best results. If there is vomiting, or to relieve the substernal distress so often complained of, lavage of the stomach may be practiced with good effect. The stomach may be washed out with sterile water with bicarbonate of soda ʒj to the quart. If the calomel produces nausea when given by the mouth, it may be washed into the stomach through the tube. Unload the lower bowel by washing out the colon, first by the usual "triplex enema," then by lavage of normal salt solution. The lavage should be repeated three or four times a day until the solution comes out clear. After the bowels have been thoroughly emptied the enteroclysis should be discontinued. I have frequently found it a very difficult matter to thoroughly empty the intestine of a pregnant woman. Following the enteroclysis the intestinal peristalsis should be stimulated by such drugs as nux vomica, cascara, and possibly aloes, while a mild impression by calomel may be kept up for some time after the attack is over and strict attention should be given to the bowels until the end of pregnancy.

Excretion through the skin should be stimulated in mild cases of toxemia by simple warm baths, proper clothing, and exercise. In cases more severe the hot pack will be necessary. These packs must be continued until a free perspiration is produced. To quiet the high-tensioned circulation, bromides or chloral in suitable doses

may be used, or the tincture of veratrum viride in doses of 15 to 20 minims is better. When the nervous tension is high a hypodermic injection of ¼ grain of morphine does good and may be repeated once. It quiets the patient's restlessness until the eliminatives have time to work.

To increase the flow of urine and favor excretion by the kidneys, the patient should drink a reasonable quantity of water, say two quarts a day (in twenty-four hours); the liquid foods also favor diuresis. Sweet spirits of nitre, citrate of soda or lithium, acetate of potash, salicylate of soda, are all of use.

The diet should be restricted to milk and milk foods, the lighter broths, and fruit during the attack. Later the white meat of chicken may be given. All stimulants should be prohibited, as they do nothing but harm. Even tea and coffee are better done without.

Plenty of fresh air is a necessity to these patients—at first in the patient's room; and later a regulated amount of exercise should be taken daily. Massage and passive movements are of use. We have never used hypodermoclysis or bloodletting unless eclampsia develops, and then there is no doubt of their usefulness in suitable cases.

As a rule we do not believe the induction of premature labor helps in the cure of toxemia where the latter comes on late in pregnancy. Certainly at least it should not be considered unless all other means of cure fail. If labor comes on spontaneously I do nothing to prevent it, but if the patient does not develop eclampsia spontaneous premature labor in my experience has been somewhat rare. The forced induction of labor seems to me to simply add the shock of a rather severe obstetric operation, and should not be considered except as a last resort. In cases of toxemia arising early in pregnancy, especially when the disease manifests itself in pernicious nausea, it may be necessary to empty the uterus promptly.

In a large number of cases the toxemia will respond to proper treatment, so that interruption of the pregnancy will be unnecessary. In the toxemia of pregnancy as in many other diseases the value of the treatment depends a great deal on the earliness of its instigation; the earlier the treatment is started the better the prognosis.

THE TREATMENT OF ECLAMPSIA, BASED UPON 86 CASES OF ECLAMPSIA AND 278 OF ALBUMINURIA IN THE MATERNITY OF THE UNIVERSITY OF PENNSYLVANIA.

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Eclampsia fortunately gives warning in all but a small proportion of cases, either by the appearance of large amounts of albumin in the urine or by the constitutional symptoms of toxemia, in the cases in which the urine is as yet free from albumin, and appropriate treatment may be instituted to avert, if possible, any outbreak of convulsions. The proportion of cases in which convulsions suddenly appear without previous warning of any kind is very small indeed, although such cases do undoubtedly occasionally occur. The most valuable symptom of impending trouble is the presence of albumin in the filtered urine, and in 85 to 90 per cent of cases it is the first symptom to make its appearance. In the remainder the constitutional symptoms of toxemia antedate the appearance of albumin. The value of the quantitative determination of urea for diagnostic purposes is practically *nil*, as it varies within such wide limits that no definite conclusion can be drawn. However, it is with the treatment of the convulsive attacks that this paper is intended to deal, and not with the preventive treatment, and it will facilitate the discussion of the subject to consider categorically the different plans of treatment which have been recommended.

1. *Anesthetics.* The only anesthetic to be considered is chloroform. Ether is a marked irritant to the kidneys, and its use will only make bad matters worse. The value of chloroform is in administering it before the convulsion begins, in the hope of

averting it. During the convulsion an anesthetic is useless, as the patient has apnea, and does not inhale it. Used to avert a convulsion, however, when the premonitory signs of the convulsion appear, chloroform is often of the greatest value.

2. *Methods of reducing blood-pressure.* The blood-pressure in eclampsia is usually extremely high. Taking the normal at 110-120, it runs to an average of 180-200 in these cases. One case in our records showed a blood-pressure too high for the Stanton instrument to record—over 300. Two methods of efficiently reducing this pressure are at our command—venesection and the use of veratrum viride. Of the two, fluid extract of veratrum viride has given the best results. Administered in an initial dose of 15 minims hypodermically, and repeated every hour in a dose of five minims for several doses, the results have been most satisfactory. Venesection is more difficult to perform, and in the cases that require it most it is often extremely difficult to get the blood to flow from the vein in sufficient quantity, although it is sometimes of the greatest value. Eight to sixteen ounces is the amount of blood it is desirable to extract.

3. *Morphine* has been extensively used in the treatment of eclampsia. Veit has reported a series of 62 cases treated with large doses of morphine, with a mortality of only 3.3 per cent. The objection to the routine use of morphine is that it is well tolerated in parenchymatous nephritis, and tolerated not at all in interstitial nephritis. In view of the uncertainty as to which class of kidney lesion we have to deal with, it is wiser to restrict the use of morphine to those cases whose convulsions are not controlled by the ordinary treatment and whose condition does not improve. If used at all, doses of ½ to ¾ grain hypodermically are given. Small doses are of no use.

4. *Chloral* is extensively used in the European clinics, and has given apparently good results. It is administered in large doses, 30 to 60 grains, by enema, to a dose. Chloral and particularly morphine have a tendency to antagonize the eliminative treatment, and for that reason also it is not advisable to use them routinely.

5. *Pilocarpine* is most dangerous. In the Edinburgh Maternity the routine use of pilocarpine gave a mortality of 66 per cent, chiefly from edema of the lungs. Its use, then, should be restricted to the cases which cannot be made to sweat by hot vapor baths or hot packs, and which are obviously not improving under treatment. Under these circumstances pilocarpine is sometimes of value. It is used in a single dose of one-eighth to one-sixth of a grain.

6. *Thyroid extract.* Since the work of Nicholson, of Edinburgh, on the influence of the thyroid gland in toxemia of pregnancy, thyroid extract has been recommended in the treatment of eclampsia, the claim being based upon its value as a vasomotor dilator. It has not yet been given a sufficiently extended trial to warrant definite conclusions as to its value, but it would seem to be more valuable in the preventive treatment than when convulsions have appeared.

7. *Catharsis.* The bowel is one of the two most important routes, if not the most important route, of elimination. Free purgation is most essential, and can be secured in several ways. If the patient is conscious and can swallow, four drops of croton oil in a little sweet oil may be dropped on the back of the tongue. She may be given two-drachm doses of a concentrated solution of magnesium sulphate every fifteen minutes until her bowels begin to move freely, remembering that it may require a very large dose, several ounces, of magnesium sulphate to be effectual. The most satisfactory means of purgation, however, is to wash out the stomach with a stomach tube, and through the tube introduce two ounces of castor oil and four drops of croton oil. A somewhat larger quantity than is actually needed is used, to allow for what may cling to the sides of the tube. An ounce of magnesium sulphate in solution may be substituted for the castor and croton oil. This method has the very great advantage of thoroughly cleansing the stomach, and that one dose of the cathartic is sufficient.

8. *Diaphoresis.* The skin is second in importance only to the bowel as a means of elimination. Sweating is best induced by a hot vapor bath, or if the apparatus for this is not available, a hot wet pack. The bath or pack is continued for a period of thirty minutes every four hours, and during it the patient's head is covered by an ice-cap. The hot pack can be made more efficient by the addition of several hot bricks, each wrapped in a towel, and four ounces of alcohol poured on each brick. They are then placed under the wet blankets, in such a position that they will not burn the patient's skin. The use of pilocarpine as a diaphoretic has already been mentioned.

9. *Hypodermoclysis* is of the greatest value, and is best given a pint at a time, under the breasts, every eight hours. A larger amount than a pint is not advisable, as there is some danger of pulmonary edema, particularly if the patient does not sweat and purge promptly and freely. The use of salt solution by the bowel is not so satisfactory, as with the amount of cathartics administered the salt solution would in all probability be promptly expelled.

10. *Forcible delivery.* The advisability of prompt evacuation of the uterus in these cases is a question which is still under discussion. It is undoubtedly true that in the majority of cases the convulsions cease, or at least diminish in frequency, after the uterus is empty. Hence it is argued that it is a good plan to artificially empty the uterus as a routine procedure. The objection is that these patients stand any operative procedure very badly, and that the mortality from shock is extremely high, much higher than that we can secure by more conservative forms of treatment. The rather violent eliminative treatment will often by itself induce labor, and hasten quite markedly the dilatation of the cervix, so that it is frequently possible in such a case to terminate a labor by forceps without shock and to the patient's great benefit. In cases where this happy result is not attained, the following measures have been recommended to secure delivery: (1) Ordinary induction of labor with bougies or bags, the labor to progress while the other treatment is being carried out. (2) Forced dilatation of the cervix by the manual method or by Bossi dilator and extraction of the child with forceps or by version—a method with considerable shock and a high maternal and fetal mortality. (3) The slow dilatation of the cervix by hydrostatic dilatation—Voorhees's bag or the Pomeroy bag, designed to dilate the lower uterine segment and vagina. (4) Vaginal hysterotomy, or vaginal Cæsarian section as it has been called; cutting the anterior lip of the cervix and extraction of the child by forceps—also a procedure of high mortality in eclampsia. (5) Cæsarian section—with too high a maternal mortality to justify the operation.

As a result of practical trial of the different methods we have come to the conclusion that it is wiser to defer any interference with labor, except under one of three conditions: If the patient is already well advanced in labor, with good dilatation, the application of forceps is advisable; if the patient is seen shortly after the onset of convulsions it is often advisable to empty her uterus by one of the slower methods of dilatation and delivery, and in such a case the Pomeroy bag will probably prove of value; if the patient is getting worse under treatment and is losing ground, it is justifiable to take the risk of delivery, in the hope of an improvement when the uterus is empty. Under other circumstances the labor is better let alone.

A Routine Method of Treatment.—It should be remembered that the place for an eclamptic is in a hospital, and that the treatment of such cases in a private house presents many more difficulties, and adds considerably to the danger. A routine method of treatment which has yielded good results in practice is the following:

1. Avert the convulsion, if possible, with chloroform, and prevent injury to the tongue during convulsions by a mouth-gag of some kind.

2. Give 15 minims of veratrum viride hypodermically.

3. Wash out the stomach, and through the tube pour in 2 ounces of castor oil with 4 drops of croton oil. Or place on back of

tongue 4 drops of croton oil and 10 drops of sweet oil.

4. Hot vapor bath or hot pack for thirty minutes in every four hours.

5. Hypodermoclysis Oj salt solution under breast every eight hours.

6. If convulsions recur, repeat veratrum viride in 5-minim doses every hour, and if after three hours pulse is still bounding and patient cyanosed, perform venesection.

7. Under ordinary circumstances let labor alone.

When eclampsia occurs in the middle trimester of pregnancy or somewhat later, a patient may recover from the attack, and her pregnancy continue. Under such circumstances she should not be allowed to go beyond the eighth month of pregnancy, and should have labor induced at that time.

Résumé of Cases.—The conclusions set forth in this paper are based upon the study and analysis of 86 cases of eclampsia and 278 cases of albuminuria—a total, allowing for 11 cases of albuminuria appearing also in the eclampsia list, of 353 patients. I shall attempt only the briefest summary of the cases:

Patients, 86; ages, 14 to 41.

Primiparæ, 65; multiparæ, 21 (including one case, aged 15, with her third pregnancy).

Number of children, 88 (two sets twins).

Deaths.—From eclampsia, 23; from ether nephritis three weeks after recovery from eclampsia, 1; from gangrene of lung two weeks after recovery from eclampsia, 1.

Death-rate.—Primiparæ, 33.8 per cent; multiparæ, 14.25 per cent.

Total death-rate chargeable to eclampsia, 27.4 per cent; excluding cases brought in in ambulance in hopeless condition (13 in number), 13.2 per cent.

Children still-born 40, of which 17 were under 8 months.

Operations.—Induced labor, 16—2 deaths; vaginal hysterotomy, 2—1 death; Pomeroy bags, 1—no death; Bossi dilators, 6—4 deaths; version after manual dilatation, 9—4 deaths; forceps, 4—no deaths; craniotomy, 2—1 death.

Of the cases of albuminuria, 278 in number, the amount of albumin varied from a trace to nine-tenths of bulk on boiling. In 11 cases labor was induced to avert an attack of eclampsia, all successfully. In 11 others convulsions suddenly appeared, 2 of which ended fatally. So that in 278 patients whose filtered urine showed albumin, eclampsia developed in 3.9 per cent in spite of treatment. Of the 278 patients 40 had had eclampsia in previous pregnancies, but escaped in the present one, under treatment.

THE STUDY OF THE URINE IN THE TOXEMIA OF PREGNANCY AND IN ECLAMPSIA.

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It is but just to say as a premise to these remarks that the experience gained in examining urines of all types leads us to believe that the results of our examinations are a very poor indication of the pathological changes existing in the substance of the kidneys or liver. It is, however, the best guide that we have at our command.

Repeated comparison of urinary examinations with both post-mortem findings and future histories of cases has changed in my mind many of the classical readings of pathological urine; casts have been divided into many more classes, especially the granular and allied forms, and the readings from some are not as serious as might be expected.

Just as no one has positively proven that the kidneys are not glands having an internal secretion of far more import in the body economy than that exercised by their excreting function, so we have been unable to prove or disprove the relationship existing between serum-albumin, the nitrogenous excretion of the urine, and the substances under discussion. And still further we have not as yet demonstrated as true or untrue that the individual cells of the kidneys, as vital organisms, selective and of their own brain acting, are only secondarily responsible for the functional disturbance of their albumin-splitting and secretion-forming properties; these are due further back to some primary disturbance in the liver,

placenta, thyroid, or other gland, or perhaps, as a still more remote cause, in the cells of the intestinal mucosa.

Finally, we do not believe that the excretions of a patient of any type whatsoever should ever be taken as indicative of any condition existing in that patient unless studied side by side with the ingestion of that patient and with a full knowledge of the symptomatology present and the previous history.

The excretion of any of the great pathological constituents of the urine, sugar, albumin, and urea, is always influenced by the intake of the food principles from which the compound is formed.

Many other men precede us on this ground, but each year we hope for a more enlightened reading of the findings.

The insistence upon a routine examination of the urine of all pregnant patients is not necessary in presenting this part of the subject to you, and yet we find that we have all much to learn as to the frequency and thoroughness of such examinations.

It is not enough that you should study the urine once a month until the last month of pregnancy, then more frequently until delivery, but each case should be a law unto itself, to be classed as possibly toxemic or not. In the first class we would include the elderly primipara, the neurotic, the luxurious, the habitually constipated, those with enlarged and tender thyroids, and such as give a history of previous toxemia—these demand an examination of excretions once every two weeks unless indicated oftener by the findings, and every week during the last month.

Should an infection of any type supervene during the course of the pregnancy, rigid examinations of the urine should be at once instituted.

Toxemic symptoms in the patient or deviations from the normal in the findings of any one specimen demand the collection of the amount excreted in twenty-four hours, and then the thorough tracing of quantities present of the following constituents: sugar, albumin, and urea, together with specific gravity and centrifuging for casts.

This paper does not include technique, but we cannot pass over one or two minor points often omitted by the best of men.

Examinations for sugar should be made after albumin has been thrown down and filtered out.

Examinations for serum-albumin should be made of filtered urine only.

Examinations for urea and ammonia should be made after filtering urine.

We have found that even when allowing for a lower nitrogenous intake the average excretion of urea in the normal pregnant patient is lower than the urea excretion of such a patient is when not pregnant. We cannot explain this; it may be true that the nitrogen is stored up in the uterine muscle or may be used in the growth of the fetus—we do not know.

The relation of the amount of urea excreted in pregnant patients shows a more variable ratio to the specific gravity of the urine than is true of non-pregnant women and of men, usually being less.

One step further: it is usually true in patients manifesting symptoms of toxemia that the urea excretion is lower than has existed in that patient under previous normal conditions in the same pregnancy.

The percentage of normal pregnant patients showing serum-albumin in the urine is in our experience comparatively small.

The presence of serum-albumin in the urine of patients exhibiting symptoms of toxemia, unless a preëxisting kidney disease be present, is the unusual rather than the usual condition, early in the toxemia; while the presence of large amounts is the usual finding in eclampsia or late in the toxemia.

From these results we deduce, as other men have, that in the majority of cases, in the early diagnosis, prophylaxis, and treatment of toxemic states of the pregnant patient, the study of the nitrogen excreted in the urine is of vital importance.

In the case of toxemia progressing to eclampsia, the quantitative study of serum-

albumin and the recognition of casts, together with the estimation of nitrogenous elimination, is to be carried out.

The results of repeated studies lead to the following conclusions: When on a normal mixed diet the nitrogenous elimination continues to fall or persists at a low figure, you can infer that the patient needs to decrease the intake or increase the output of nitrogen principles. But when the diet has been restricted in nitrogen principles you must expect to find a low excretion of nitrogen, and then a very low and persistently low excretion should be carefully watched and associated with the clinical symptoms.

You will notice that we refrain from using any hard and fast numbers below which it is dangerous to go; there can be no such estimates. We have repeatedly followed patients with urea output below one per cent, total daily output about thirty-five to forty ounces, and certainly did not think them toxemic because we knew they were on a milk diet; so in all such estimations we find no definite lines of demarcation, but rather food for study, further examination. and more careful watching, should the urea continue low.

In a progressively increasing toxemic patient careful examinations are also made for kidney débris and albumin, and even should they not be present the relatively low and long-continued urea output is an indication for severe measures to promote excretion.

There is a form of toxemia described elaborately by Dr. Williams, of Johns Hopkins Hospital, which he attributes to the perversion of the nitrogen elimination, and producing the true pernicious vomiting of pregnancy. Our studies in the same field have not given the results that he has obtained, and certainly are not sufficiently well defined to base operative measures upon the findings.

The nitrogen is eliminated in the urine as urea, ammonia, purin bodies (xanthin, hypoxanthin, or nuclein bodies), and as uric acid. Considering this total nitrogen output as one hundred per cent, urea makes eighty-five to eighty-seven per cent, ammonia four to six per cent, and the other two bodies about eight per cent, the two most important being urea and ammonia.

Studies of urine of pernicious nausea cases revealed that when not neurotic the total excretion of nitrogen was normal, but that the percentage of ammonia was increased at the expense of urea, rising to ten, twenty, and even forty per cent, while the urea decreased proportionately, and that this form of toxemia differed from that spoken of above and eclampsia by different pathologic changes in the liver simulating acute yellow atrophy.

Studies made of toxemic patients other than pernicious nausea have revealed in our hands a rise in the ammonia coefficient to as high as eight or nine per cent, when one patient in the last few weeks of pregnancy, exhibited only toxemic symptoms, general and cerebral, and not nausea.

We cannot but think that the toxemia may not be of a special character, but in these instances it progresses far enough to produce changes in the liver substance which are then responsible for the ammonia excretion, and such changes are present in other toxemias than those exhibiting vomiting.

Dr. Williams had found these changes so constant that when the ammonia rose above ten per cent he was inclined to interrupt the pregnancy.

We would again call attention to the necessity for repeated examinations should any infection occur during any period of pregnancy. While attention to your toxemic patients may usually avert eclampsia, you may some day find the storm break out after an attack of influenza or similar infection.

In the presence of a severe toxemia or eclampsia the quantity of urine plays the most important part, and while it is of importance to record the presence of large amounts of albumin and a low urea estimate, it usually adds nothing to our treatment.

After the convulsions are controlled and until the patient is entirely well a thorough study of the urea excretion is again of prophylactic import.

THE EXTERNAL INFLAMMATORY DISEASES OF THE EYE.[1]

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There are several conditions characterized by or associated with redness of the conjunctiva which at first glance seem to resemble each other closely, but upon careful study they present points by which they are distinguished from each other.

Among such diseases may be mentioned conjunctivitis in its various forms, iritis, scleritis, and acute inflammatory glaucoma.

It is very important for the successful treatment of these conditions that they shall be recognized early, and it is my object to review the symptoms and objective manifestations of these conditions in order to aid in differentiating between them, and briefly review their treatment.

In the first place, conjunctivitis, broadly speaking, is an inflammation of a mucous membrane, and, in common with all mucous membranes, this inflammatory process is associated with a mucopurulent discharge. If the discharge is not mucopurulent, it is not conjunctivitis.

Taking up then the different forms of conjunctivitis, we have first *simple conjunctivitis,* sometimes spoken of as acute catarrhal or mucopurulent conjunctivitis, characterized by increased secretion, which, following a dry stage of from twenty-four to forty-eight hours, is at first watery, which overflows the lids, producing irritation of the surrounding skin. This soon becomes mucous or mucopurulent in character, appearing over the surface of the cornea and in the palpebral fissures as grayish-white films or flakes which interfere with vision, and in drying glues the edges of the lids and binds the cilia together, especially in the mornings. The *bulbar conjunctiva* is bright-red, swollen, and in severe cases presents small hemorrhages over it. The blood-vessels can be seen very much swollen and capable of being moved by slight pressure and movement of the lower eyelid with the finger. The *palpebral conjunctiva* shares in the inflammatory process and the lids become swollen. The patient complains of a burning, itching, and gritty sensation of the lids. Photophobia and blepharospasm are not marked as long as the cornea is not involved.

The causes of this condition are infection by microörganisms; rapid changes in temperature associated with faulty nutrition; dust, smoke, foreign bodies, systemic diseases, nasal diseases, and uncorrected eye-strain.

Acute contagious conjunctivitis, epidemic catarrhal conjunctivitis, or "pink-eye," is an acute, highly contagious, mucopurulent inflammation of the conjunctiva due to the Koch-Weeks bacillus. Both eyes are usually affected.

The patient first complains of a mild burning sensation of the lids, which are stuck together upon waking in the morning, and some increase in lacrimation. About the third day these symptoms become worse and the patient complains of a sensation as of a foreign body in the eye. There is some photophobia and pain upon using the eyes. The ocular conjunctiva is a bright-red color, whence the name "pink-eye." The palpebral conjunctiva is deeply injected and the retrotarsal folds are thickened. The lids themselves are swollen. The acute stage usually lasts from four to ten days, the symptoms gradually subsiding. Hemorrhages are generally present within the layers of conjunctiva, and as a result of the constancy with which these occur the disease has been called hemorrhagic conjunctivitis by English writers.

The diagnosis will rest upon the fact that several members of the family or commun-

[1]Lecture delivered at the Polyclinic Hospital and College for Graduates in Medicine, Nov. 19, 1906.

ity are affected, upon microscopic examination, and upon the appearance of hemorrhages in the conjunctiva about the third or fourth day.

A *chronic catarrhal conjunctivitis* is caused by the diplobacillus of Morax and Axenfeld, which is characterized by a chronic, not very severe blepharoconjunctivitis, without follicles or membrane, but with a typical erythema of the edges of the lids, with slight maceration of the skin, most marked at the angles, especially the internal angles. The secretion is watery but not copious. It is extremely contagious. The diagnosis rests upon the finding of the microörganisms in the secretion upon microscopic examination.

Purulent conjunctivitis is a term usually applied to infection by the gonococcus of Neisser, although purulent inflammation may result from infection by the pneumococcus of Fränkel, the streptococci, and the staphylococci.

Gonorrheal conjunctivitis is caused by infection with the gonococcus of Neisser, and is seen most frequently in infants (ophthalmia neonatorum), although it may occur in adults (gonorrheal ophthalmia).

The early recognition and treatment of this form of conjunctivitis is of the utmost importance in order that the patient's sight may be saved. From 75 to 80 per cent of the cases of blindness occurring early in life are the result of careless or delayed treatment of this form of conjunctivitis.

Ophthalmia neonatorum usually begins on the third day after birth, although it may occur as early as twelve hours after birth, with swelling and redness of the lids and a slight turbid discharge. This soon changes to a yellowish or greenish-yellow pus which is very abundant. The *ocular* conjunctiva is intensely congested, later becoming chemotic and infiltrated, forming a hard rim surrounding the cornea which forms the bottom of this depression. The *palpebral* conjunctiva is bright-red and smooth at first; later the lids become less swollen, the conjunctiva becomes soft and puckered into folds, its surface becoming rough, velvety, and dark-red in color.

Both eyes are usually affected, the one later than the other. The greatest danger in these cases is the formation of corneal ulcers which by perforation allows the infection to spread to the deeper tissues, producing virulent inflammations or panophthalmitis. Even when corneal ulcers do not perforate, the resulting scars are sometimes so dense that the eye is rendered useless.

Gonorrheal ophthalmia in adults presents much the same characteristics as that occurring in infants. The cornea is more frequently involved than in infants, and in many instances the sight of both eyes is entirely destroyed in spite of most energetic treatment.

The prognosis is somewhat more favorable in infants than in adults, and the sight can usually be saved if the patient is seen early and the proper treatment employed.

The diagnosis is based upon the time of onset, the character of the inflammation, and microscopic examination.

The diagnosis of other forms of purulent conjunctivitis due to the pneumococcus, the staphylococci, and streptococci is based upon the result of microscopic examination.

Membranous conjunctivitis is represented by two forms, the acute membranous or diphtheric and the chronic membranous or croupous.

Diphtheric conjunctivitis is due to infection by the Klebs-Loeffler bacillus and is characterized by intense, dusky-red swelling of the eyelid which closes the eye completely, the lid being raised or everted with difficulty. The folds of skin over the lid are obliterated. The palpebral conjunctiva is covered with a thick gray membrane which is closely adherent. Forcible removal of this membrane leaves a raw bleeding surface, which is soon covered again with newly formed membrane. The secretion at this time is serous and at times slightly tinged with blood.

After a period ranging from three to

seven days the lids become less rigid, the secretion becomes thick and purulent in character and very abundant. Large shreds or patches of false membrane may come away.

The disease varies greatly in severity. In some cases it is so mild that the true nature of the disease is not recognized, while in others rapid destruction of the cornea and surrounding tissues takes place.

The diagnosis is established by finding the bacillus in the secretions.

Chronic membranous conjunctivitis, formerly spoken of as croupous conjunctivitis, differs from diphtheric conjunctivitis in that there is only slight swelling of the lids and the attack is more prolonged. The false membrane is more superficial and can be removed with less difficulty, without causing more than a slight bleeding; it rapidly reforms when removed. The bulbar conjunctiva is not involved as it is in diphtheric conjunctivitis. The cornea usually escapes, except in very severe cases.

The absence of the Klebs-Loeffler bacillus, the soft swelling of the lids, and the superficial character of the membrane tend to differentiate it from diphtheric conjunctivitis.

Granular conjunctivitis or trachoma is characterized by the formation of granulations on the palpebral conjunctiva and the palpebral folds. The so-called *papillary* granulations are circumscribed aggregations of lymphoid cells and are most abundant in the tarsal conjunctiva of the upper lid. They are less numerous in the lower tarsal conjunctiva. *Follicular* granulations are most abundant in the retrotarsal folds and appear as hemispherical, semitransparent bodies of a grayish-pink or white color. They may be disseminated or arranged in parallel rows forming a dense, unyielding mass.

In general appearance the mucous membrane is at first rough and uneven, containing grayish-white, semitransparent bodies which vary in size, and from their appearance have been called "sago-grain" granulations. They develop first in the lower cul-de-sac. There may be no irritation and but slight discharge.

Later the follicles grow larger, are crowded more closely together, are elevated above the surface of the conjunctiva, and very dark-red in color, giving the lid when viewed from the outside a dark appearance. The lid is thickened and stiffened so that the normal folds in the skin of the upper lid do not form, the lid is pushed down and the palpebral fissure narrowed, giving the patient the characteristic dreamy or sleepy appearance of this stage. These changes are associated with irritation, mucopurulent or purulent secretion, photophobia, and local pain if the cornea becomes involved. The follicles finally undergo degenerative changes in which they shrink and gradually pass into the stage of cicatrization. In this stage, grayish-white scar lines appear throughout the conjunctiva. The contraction produced by these fibrous changes gives rise to various deformities of the lid and its border, such as entropion, ulceration of the cornea, and pannus. Pannus consists in the formation of vascular tissue over the cornea, usually beginning under the upper lid and extending downward, until, in severe cases, it involves the whole cornea. The blood-vessels are continuous with those of the conjunctiva. There is more or less disturbance in vision, and in severe cases blindness may result.

Vernal conjunctivitis, sometimes spoken of as spring catarrh, Fruehjahr's catarrh, is a chronic form of conjunctivitis characterized by the presence of hard, flattened, closely packed, tesselated granulations in the palpebral conjunctiva which are pink in color, although the surface seems to be covered with a grayish film or opacity. The conjunctiva at the corneoscleral junction is thickened, forming pale, translucent nodules of waxy appearance which may encroach upon the cornea but do not undergo degeneration. These nodules may be the only manifestations, and the conjunctival injection will then be localized. There is present a mucous or mucopuru-

lent secretion which tends to form shreds in the retrotarsal folds and gives the sensation of a foreign body. Considerable itching, stinging, and burning of the lids with dimness of vision may be complained of. The lids may be glued together by the secretion in the mornings. The symptoms are aggravated by heat and are most troublesome in the summer months, while they give little annoyance in winter.

The diagnosis is established by the history of the case. The fact that it recurs and is aggravated by warm weather should help make the diagnosis clear. It differs from trachoma in the flattened appearance of the granulations, the absence of infiltration and pannus. It differs from phlyctenular conjunctivitis in that the pericorneal elevations are not so transient and do not break down and form ulcers.

Phlyctenular conjunctivitis occurs most frequently in strumous and ill-nourished children. It is characterized by the formation in the bulbar conjunctiva or at the corneoscleral junction of circular elevations or phlyctenules of a reddish-gray color surrounded by a zone of marked conjunctival injection, or by a fan-shaped network of engorged vessels running up to and ending in the phlyctenule. Later, these are changed into small, circular masses of yellow necrotic tissue which eventually break down, forming small, shallow ulcers. The phlyctenules may be single or multiple; if the cornea is not involved they cause slight discomfort, such as lacrimation and a slight stinging sensation or a feeling as though a foreign body were present. If there is corneal involvement there will be photophobia and blepharospasm in addition to the above symptoms.

Phlyctenules are distinguished from the elevations occurring in the early stages of scleritis by the fact that the latter do not break down and form ulcers. Also in scleritis the surrounding injection is bluish and not so superficial. The pain is also greater.

Iritis may simulate or be associated with conjunctivitis, so that it is necessary to bear both in mind in examining a patient in whom the bulbar conjunctiva is injected.

Iritis may be idiopathic, traumatic, or the result of constitutional disease. The objective symptoms of iritis are pericorneal injection, producing a fine, purplish-pink zone surrounding the cornea due to injection of the non-perforating branches of the ciliary vessels. In severe cases the conjunctival vessels are also injected. The pupil is contracted, while the reaction to light and mydriatics is diminished or lost. The iris is changed in color; a blue iris becomes green, while a brown or dark iris appears muddy and darker than the normal. Inflammatory attachments or posterior synechiæ may form between the iris and capsule of the lens. These are demonstrated by the failure of the iris to react freely and evenly to mydriatics. If the iris is attached at one or more spots the pupil will react unevenly. If the attachments are recent the iris may be pulled loose by a mydriatic, leaving small pigmented spots on the surface of the capsule of the lens. In severe cases a false membrane may form in the pupilary area as a result of the deposition of inflammatory exudates. The cornea also appears hazy as a result of these deposits on its posterior surface, and the aqueous may be turbid because of the presence of blood, pus, and inflammatory exudates.

The subjective symptoms are intense pain of a throbbing, stabbing character, which is worse at night. Vision is blurred in direct proportion to the amount of cloudiness of the media. The eyeball is very tender, and there is usually intense photophobia and lacrimation.

Inflammations of the episcleral tissue (episcleritis) and of the sclera itself (scleritis) may occasion some difficulty in differentiation.

Episcleritis occurs as small dusky-red or violet subconjunctival swellings situated in the ciliary region, usually on the temporal side of the cornea, although they may appear in other portions of this region. They are not movable with the

conjunctiva and do not ulcerate, but disappear by resorption, often leaving a slate-colored scar behind to which the conjunctiva is adherent. The nodule feels hard and is very sensitive to the touch. The patient may or may not complain of pain.

The cornea and uveal tract rarely share in the inflammation.

Scleritis occurs as a more diffuse, bluish-red discoloration associated with a more diffuse swelling not composed of isolated prominences. Later the color changes to a pale violet. It differs from episcleritis in that the cornea and deeper portions of the eye are more frequently involved, giving rise to iritis, choroiditis, opacities of the vitreous, and cataract formation. Staphyloma, due to a weakening of the scleral tissues, may also occur.

Acute inflammatory glaucoma is associated with general hyperemia, and at times edema of the conjunctiva. At the same time there is enlargement and tortuosity of the episcleral veins, which are distinguished from conjunctival vessels in that they do not move with the conjunctiva.

The diagnostic points of acute glaucoma are referable to other parts of the eye, namely, the steamy and anesthetic cornea, the semidilated, immobile pupil, the shallow anterior chamber and turbid aqueous, the discolored iris, and the rise in intraocular tension.

The subjective symptoms consist in agonizing pain in the head, blindness, the appearance of a halo around a light, and limitation of the visual field.

The following table shows the differential points between simple conjunctivitis and the three most important diseases of the eye which may be confused with it:

	Simple conjunctivitis.	Iritis.	Glaucoma.	Scleritis, or episcleritis.
Pain	As of a foreign body.	Severe, worse at night.	Agonizing in head.	May or may not be present.
Vision	Unimpaired.	Dim.	Dim or absent.	Normal.
Photophobia	Absent.	Severe.	Absent.	Absent.
Injection	Coarse superficial.	Fine, deep pericorneal.	Present in episcleral veins.	Bluish-red, localized or diffuse.
Secretion	Mucopurulent; flaky.	Increased lacrimation.	Not marked.	Not marked.
Pupillary reaction	Normal.	Sluggish or absent.	Sluggish.	Normal.
Color of iris	Normal.	Changed.	Normal.	Normal.
Tenderness	Not marked.	Marked.	Not marked.	Marked over area involved.
Synechiæ	None.	Posterior.	None.	None.
Tension of eyeball	Normal.	Normal or increased.	High.	Normal.

TREATMENT.

The treatment of *simple conjunctivitis* consists in freeing the edges of the lids and cilia of accumulated secretion by washing with Castile soap and warm water, then flushing the conjunctival cul-de-sacs with a saturated solution of boric acid, to which camphor water may be added in the proportion of one fluidrachm to the ounce. This solution should be used every three hours and followed by one drop of a solution of zinc sulphate, one-half to one grain to the fluidounce of distilled water, to act as an astringent. Attention should be directed to the hygienic surroundings and general nutrition of the patient and to the treatment of existing nasal disease.

In *acute contagious conjunctivitis* due to the Koch-Weeks bacillus, the patient should be warned about spreading the infection through towels, etc. All such articles used by him should be sterilized. The burning pain may be relieved by the application of cold compresses frequently applied. If the secretion is abundant, a solution of silver nitrate, 2 to 5 grains to the ounce of distilled water, may be applied to the everted lids after cleansing with a saturated solu-

tion of boric acid. Zinc sulphate solution, ½ to 1 grain to the ounce, is useful as an astringent.

That form of conjunctivitis which is due to the diplobacillus of Morax and Axenfeld yields promptly to a solution of zinc sulphate, 1 to 2 grains to the ounce, applied three or four times a day.

The prophylactic treatment of *ophthalmia neonatorum* consists in instilling one or two drops of a two-per-cent solution of silver nitrate into each eye after the first bath. All linen or other fabrics which have been soiled by the discharge should be burned or disinfected. The sound eye should be washed frequently with a mild antiseptic solution.

During the early stage of a developed case of ophthalmia neonatorum, cold compresses should be applied to the eye constantly, night and day, for the first thirty-six to forty-eight hours. This is done by placing the compresses upon a block of ice and applying them to the eye at intervals of half a minute. The purulent secretion should be removed every half-hour by flushing the eye with boric acid solution and by means of cotton wrapped upon wooden applicators.

After cleansing, the conjunctiva of the lids should be painted with a one- or two-per-cent solution of silver nitrate once or twice a day, the excess being removed by flushing with normal saline solution.

The newer silver salts, argyrol and protargol, are used as substitutes for silver nitrate with equally good results by some practitioners. They are less irritating than silver nitrate. Argyrol is less irritating and is said to be more bactericidal than protargol. It is used in from 15- to 50-per-cent solutions, once or twice a day, depending upon the severity of the disease. Protargol may be used in from 15- to 25-per-cent solutions.

If ulceration of the cornea develops, one or two drops of a solution of atropine sulphate, 4 grains to the ounce, should be instilled three times a day. In addition, the ulcer may be touched with pure tincture of iodine by means of a pointed applicator wrapped with a little cotton, after first cleansing the floor and edges of the ulcer and using one or two drops of a 4-per-cent solution of cocaine hydrochloride to decrease the pain.

The treatment of gonorrheal ophthalmia in the adult does not differ materially from that given above. The same prophylaxis is necessary, particular care being taken to protect the sound eye. This may be done by means of a shield of glass such as a watch crystal placed over this eye and its edges held to the skin by means of adhesive strips. There is more danger of blindness from corneal involvement and spread of the inflammation to other portions of the eye in adults than in children.

Croupous conjunctivitis should be treated by the use of antiseptic washes, such as boric acid in saturated solution, corrosive sublimate 1:10,000, potassium permanganate 1:2000, or liquor formaldehydi 1:10,000 to which holocaine hydrochloride has been added in the proportion of 5 grains to the ounce.

In diphtheric conjunctivitis the same antiseptic solutions may be used. Cold applications are of value early in the attack. All articles which have been soiled by the discharge should be disinfected or destroyed. The sound eye may be protected by a shield. Antitoxin should be used to combat the infection.

Trachoma or *granular conjunctivitis* in the early stage should be treated by the application of cold to reduce the inflammatory reaction; a solution of boric acid may be used to cleanse the eye, and one drop of a solution of atropine sulphate, 4 grains to the ounce, should be used three times a day if the iris is involved.

In the second stage astringents are applicable. Copper sulphate crystal or glycerite of tannin 60 grains to the ounce may be applied to the everted lid daily. Silver nitrate solution, two-per-cent, may be used once daily if there is a purulent or mucopurulent discharge.

The pannus which follows trachoma is sometimes relieved after the use of jequirity, one per cent, for several days.

The treatment of *vernal conjunctivitis* is mostly palliative. A solution of boric acid may be used to cleanse the eye, and yellow oxide of mercury ointment, one or two per cent, may be applied once or twice a day. Zinc sulphate, 1 grain to the ounce, or glycerite of boroglycerin, 50 per cent, is sometimes used as an astringent. The disease disappears in winter, but recurs upon the advent of warm weather.

Phlyctenular conjunctivitis in children should be combated by the use of hot compresses applied to the eye for five or ten minutes every three hours, boric acid solution for cleansing purposes, and yellow oxide of mercury ointment, one or two per cent, applied inside the lid once or twice daily after the phlyctenule has broken down. This should be followed by massage of the eyeball for a few minutes. Calomel is sometimes dusted into the eye daily with beneficial results, although this should not be done if the patient is taking iodides internally, as iodine is eliminated in the tears and forms mercuric iodide, which burns the conjunctiva.

The beginning treatment of *iritis* consists in the administration of a brisk purge, such as calomel followed by a saline, and in the instillation of one drop of a solution of atropine sulphate, 4 grains to the ounce, into the conjunctival cul-de-sac three or four times a day until all congestion has disappeared. This use of a mydriatic tends to decrease pain, lessen congestion, and prevent adhesions of the iris to the capsule of the lens. Leeches may be applied to the temple to relieve congestion.

Hot compresses, as hot as can be borne, tend to relieve the pain.

Dionin has been used with gratifying results, especially in promoting the absorption of inflammatory exudates: one drop of a 5- or a 10-per-cent solution may be dropped into the eye once daily for three days, then stopped for three days, when it may be repeated as before. This drug causes a great outpouring of serum beneath the conjunctiva within a few minutes after its instillation. This entirely disappears by the following day. The eye is usually less painful after the use of this drug, and the inflammatory products are promptly absorbed as a result of the increase in lymphatic activity produced by it.

The history of syphilis or rheumatism calls for remedies to combat these underlying causes.

Scleritis and *episcleritis* should be treated by the use of atropine if iritis is present, otherwise the use of one drop of eserine sulphate solution, ½ grain to the ounce, is beneficial. Yellow oxide of mercury ointment, 1 grain to the ounce, may be used in the eye, accompanied with massage over the lid in chronic cases. Salicylates and potassium iodide may be used internally if there are any underlying rheumatic tendencies.

In acute inflammatory glaucoma a myotic is indicated: one drop of a solution of eserine sulphate, ½ to 1 grain to the ounce, should be instilled every hour or two.

A mydriatic must never be used.

Later, iridectomy should be performed if relief is not obtained.

THE RELATION OF THE VOLUME OF AIR INSPIRED TO THE RISE OF TEMPERATURE IN NEUROGENIC FEVER.

BY ISAAC OTT, A.M., M.D.,
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AND
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Whilst on a visit to Prague, Professor Gad suggested to one of us (Ott) a study of the volume of air inspired in relation to the fever produced by puncture of the thermogenic centers. We thought it best to first take up the rise of temperature caused by tetra-hydro-beta-naphthylamin chloride and its relation to the volume of air inspired. Some years ago Ott published a paper on the seat of the rise of temperature produced by this naphthylamin compound, and localized the seat of it in the corpus striatum and tuber cinereum. We have repeated these experiments and obtained the same results as previously published.

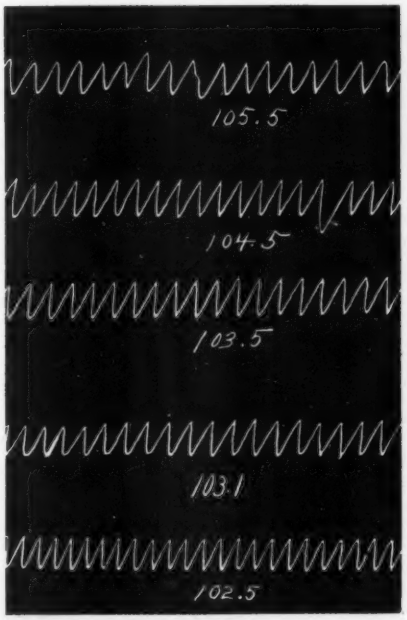

FIG. 1.—Experiment 15. 102.5° F. is normal curve. All subsequent curves are after the administration of tetra-hydro-beta-naphthylamin.

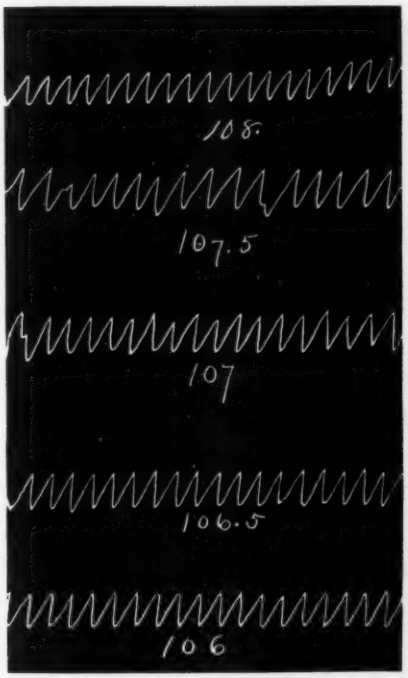

FIG. 2.—Continuation of Experiment 15. Figs. 1 and 2 show the diminished quantity of air inspired after the naphthylamin.

These experiments show that the naphthylamin is powerless to elevate the temperature after cutting out the corpus striatum and tuber cinereum. It also shows that thermogenic centers do not exist in the pons or medulla or cord. As the drug is a great stimulant to heat-producing centers, to assume a thermogenic center in these parts which has a different stimulant is begging the question. In the naphthylamin experiments the temperature continues rising although the rate of respiration, the heart-beat, and arterial tension are decreasing, showing how little thermo-

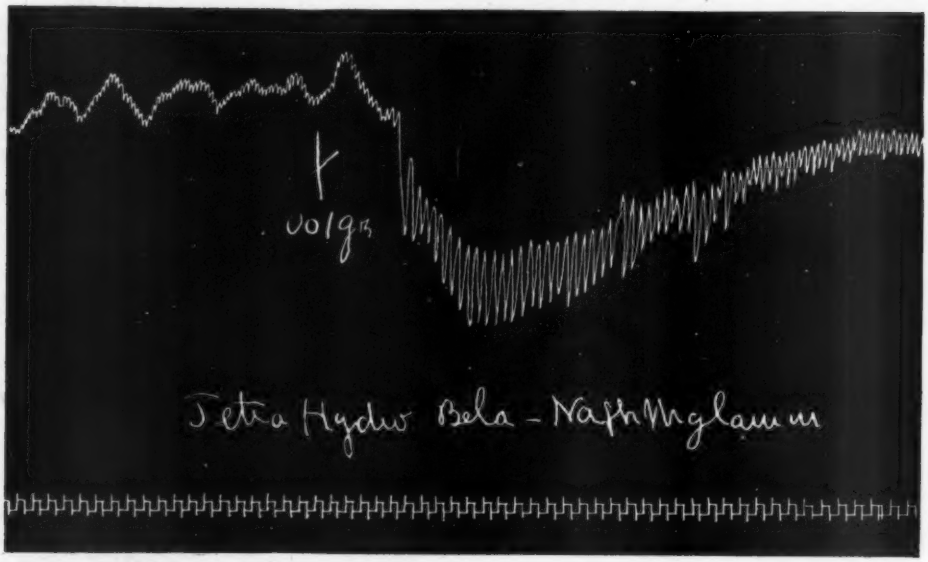

FIG. 3.—Effect of tetra-hydro-beta-naphthylamin on the pulsation of heart and the arterial tension. The line marking seconds is also the abscissa line.

genesis is dependent upon the full activity of these organs.

We then took up the study of the volume of respired air to the rise of temperature produced by the drug. To measure the volume of air we used Gad's aeroplethysmograph as made by Krusich, of Prague. The chamber intercalated between the trachea of the rabbit and the plethysmograph had a capacity of about 1900 cubic centimeters. After each observation of about a minute the chamber was removed and attached to the artificial respiration apparatus and the carbon dioxide accumulated there driven out. The aeroplethysmograph was graduated, and it was found that a movement of the writing point for 5 millimetres indicated 20 cubic centimeters of air. Gad's three-way cannula was inserted into the trachea of the large etherized rabbit. Chloretone was used as a narcotic in one experiment, but the lowering of temperature by it prevented in great part the rise produced by the naphthylamin. Hence ether was used in all the experiments. Twenty-seven experiments on rabbits were performed. In all of the experiments performed we found that the rise of temperature was always accompanied by a diminution in the rate of respiration and of the volume of air inspired (Figs. 1 and 2). The naphthylamin compound has a slowing effect on respiration and heart-beat and a depressing action upon arterial tension (Fig. 3). Now the question arises, Has the volume of air inspired any necessary relation to the rise of temperature? In the experiment with naphthylamin the decrease of

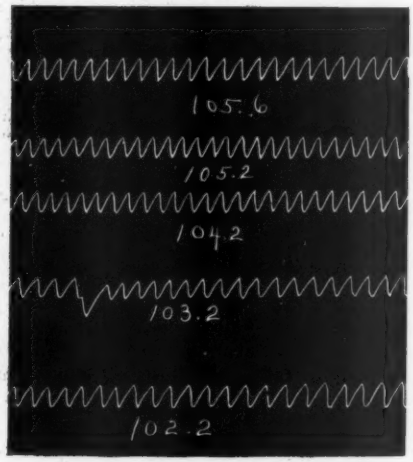

FIG. 4.—Showing the increased amount of air inspired as the temperature rises. Puncture in the tuber cinereum The line 102.2° F. is the normal curve.

oxygen inspired could not be invoked to account for the rise of temperature. The lowering of blood-pressure means a dilatation of the capillaries or at least not a constriction, and hence an increase of dissipation of heat.

Hence we are led to the conclusion (1) that the naphthylamin compound in its action proves the existence of thermogenic centers in the corpus striatum and the tuber cinereum; (2) that the volume of air inspired diminishes as the temperature rises.

Puncture of the Thermogenic Centers.—Here we used ether, and the rabbits were fastened on their backs during the experiment. This accounts for the want of excessive rise of temperature. The temperature of the room averaged about 75° F. In all the experiments, whether on corpus striatum or tuber cinereum, with the rise of temperature there was an increased rate of respiration and a greater volume of air taken in. This is shown in Fig. 4. Now, does the rise of temperature depend upon the increased volume of oxygen inspired? There is no doubt that a puncture of the thermogenic center is accompanied by an increase of heat production, as has been shown by Ott. Sachs and Aronsohn have also shown that the nitrogen excretion is increased. The need of the muscles for oxygen regulates the amount taken in and not the excess of oxygen present. In the experiments with naphthylamin the supply of oxygen was diminished, yet the temperature rose to 108° F. Although the ordinary supply of oxygen is exceeded in the rise of temperature by puncture of the brain, we incline to the belief that there is no necessary relation between the rise of temperature and the volume of oxygen inspired.

IS THE USE OF IODIDE OF POTASSIUM ADMISSIBLE IN PULMONARY TUBERCULOSIS?

BY H. R. M. LANDIS, M.D.,

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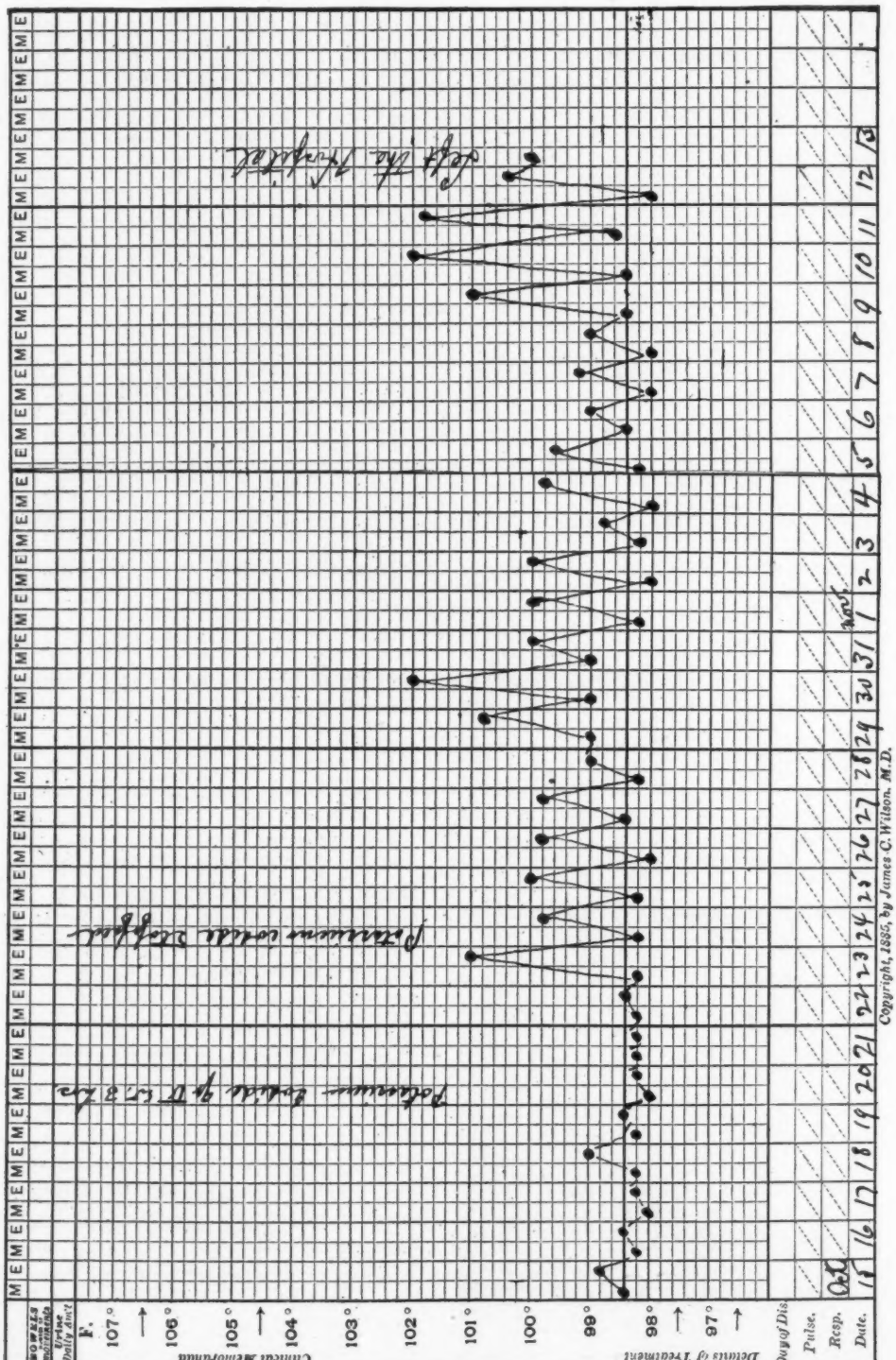
The advisability of using iodide of potassium for diagnostic purposes in cases of suspected pulmonary tuberculosis is believed by some to be a justifiable procedure. There are many, however, who look upon this use of the drug as unwarranted and not altogether free from danger.

About two years ago I undertook some experiments at the Phipps Institute to determine, if possible, whether iodide of potassium had any ill effects when administered to rabbits previously inoculated with an attenuated culture of the tubercle bacillus. The amount of iodide of potassium given to the rabbits was based on a daily dosage of thirty grains to a man weighing 150 pounds. Later the amount was greatly increased, as much as five grains daily being given to the rabbits. These experiments failed to demonstrate that the iodide of potassium had any deleterious influence on the tuberculous process, as no perceptible difference could be detected between the experimental animals and the controls. My interest in the question was renewed, however, by a recent clinical observation which would seem to indicate that the use of iodide of potassium for diagnostic purposes is open to some criticism. The history of the case is briefly as follows:

A woman aged thirty-six was admitted to the hospital complaining of epigastric pain. The family and past medical history were negative. Until eighteen months prior to her admission she had always enjoyed good health. At this time she first complained of vague abdominal pain, which, however, would disappear from time to time. She had never had any


Clinical Memoranda
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Date.
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cough nor blood-spitting. One year ago she had had "malaria," and since the beginning of her illness had lost 25 pounds in weight. The patient was a fairly well-nourished woman with a slight degree of secondary anemia. The abdomen was flabby and soft, with diastasis of the recti muscles. The presence of a well-marked gastroptosis accounted for the abdominal pain and other gastric symptoms. In the routine examination some indefinite signs were detected at the right apex. To determine the cause of these signs she was given five grains of iodide of potassium every three hours. It will be noted in the accompanying chart that the temperature was normal prior to the use of the iodide of potassium. On the third day after its administration the temperature rose abruptly, a cough developed, and sputum containing tubercle bacilli was obtained. Coincidentally with this, numerous fine, crackling râles appeared over the upper part of the right lobe. Previously the râles had been very few. This condition persisted until she left the hospital three weeks later.

The tuberculous process in this case was undoubtedly quiescent, and so far as can be judged from the history of the case was causing no disturbance, as the gastric condition would readily account for her ill health.

The diagnostic use of iodide of potassium was advocated by Sticker in cases presenting doubtful apical signs and without expectoration. To such cases he advised the administration of small doses of the drug for several days, when not infrequently the signs of a local catarrh would appear over the suspected area, and the cough, previously dry, would become productive of expectoration which invariably contained tubercle bacilli. The advisability of using potassium iodide under these circumstances seems to me to be open to some criticism, even though it has the sanction of so eminent an authority as Turban, who states that it forms an available diagnostic agent if the patient refuses to submit to the tuberculin test. Turban looks upon the reaction as specific only when tubercle bacilli are found, as in cases of undoubted tuberculosis he frequently failed to find the bacilli. Even admitting the harmlessness of potassium iodide under these circumstances the necessity of resorting to this test should be extremely infrequent. Trudeau in alluding to the tuberculin test states that in his opinion it should only be used when repeated and careful examinations still leave one in doubt. If this is true of tuberculin, the safety of which is now well established, how much truer must it be of iodide of potassium, the action of which in tuberculous cases is but little understood. Greater familiarity with the signs and symptoms of incipient tuberculosis will render a resort to such diagnostic agents less and less frequent.

While the presence of tubercle bacilli in the sputum is now looked upon as indubitable proof that a pulmonary tuberculosis exists, it must be clearly borne in mind that many cases in the early stages of the disease fail to show bacilli in the sputum. To wait for this assurance means the loss of valuable time when patients can most readily be restored to health. The fear of subjecting patients to the time and expense of a climatic cure doubtless accounts for the timidity in making a positive diagnosis in cases presenting slight signs. To state that indefinite signs at an apex are probably due to a tuberculous process does not, however, mean that the individual must, of necessity, go to the expense of seeking climatic treatment. It has been amply demonstrated that these cases can often be successfully treated, even in their home surroundings, if instructed as to the proper mode of living. For this reason I think we should be wary of subjecting patients to a test which, while it confirms our suspicions, certainly causes an activity of the disease which may be difficult to control.

Inasmuch as it is apparent that an incipient or quiescent lesion may be aroused

into activity by the use of potassium iodide, it would seem that its use in the more advanced stages of tuberculosis might be productive of harm rather than good. As iodide of potassium fulfils no distinct indication in the treatment of tuberculosis and there is reasonable evidence as to its dangers, the safer course would be to avoid it altogether. When, however, tuberculosis and syphilis coexist iodide of potassium is often necessary, and under these circumstances may be given.

Occasionally, too, one encounters a case in which the pulmonary lesion is suggestive of syphilis. If repeated sputum examinations fail to show the tubercle bacillus, iodide of potassium may be used as a therapeutic test. Several cases have been recently reported in which the probability of lung syphilis seemed to be established because of the fact that the lesion disappeared under the use of the iodide, the assumption being that the lesion would have remained unchanged or have been made worse had it been due to tuberculosis.

THE LOCAL USE OF MAGNESIUM SULPHATE SOLUTION IN INFLAMMATION.[1]

BY HENRY TUCKER, M.D.,
Genito-Urinary Surgeon, Philadelphia General Hospital.

Knowing that magnesium sulphate in solution when used hypodermically has distinct anesthetic properties, I first tried it as a local application with the object of getting a treatment which would relieve local pain, as all other external applications tried had been found almost valueless.

After experimenting for several years with many recognized local remedies, I had about reached the conclusion that rest in bed accomplished as much as any local application, but the remarkable results in the relief of pain obtained by the use of this substance and the abatement of inflammation have led me to report my experience.

This treatment, at my suggestion, has been used by a veterinarian with decided success in the leg injuries of thoroughbred horses.

The majority of the following cases were treated in my wards at the Philadelphia General Hospital. The case of tuberculous peritonitis was seen at the Phipps Institute. The others were met in my private practice.

CASE I.—G. M. Double orchitis following mumps. Both testicles slightly swollen and painful. Solution gave immediate relief to pain. Testicles of normal size at the end of third day.

CASE II.—L. F. Gonorrheal epididymitis. Solution gave almost immediate relief. Was not confined to bed.

CASE III.—L. F. Gonorrheal epididymo-orchitis. Marked pain, but slight swelling; pain disappeared in three hours; testicle normal in size in five days.

CASE IV.—S. R. Gonorrhea. Both testicles involved; great pain; pain relieved in five hours; swelling disappeared in three days.

CASE V.—J. A. Right gonorrheal epididymo-orchitis. Relief from pain in a few hours, and from swelling in thirty-six hours.

CASE VI.—E. G. Gonorrheal epididymitis of the left testicle. Pain relieved in ten hours; testicle normal in size in five days.

CASE VII.—J. M. Gonorrheal involvement of the left testicle. Pain relieved in five hours. Out of bed without permission. Relapse. Relief in three hours. Well in two days.

CASE VIII.—O. R. Gonorrheal epididymo-orchitis. Pain relieved in three hours, swelling in two days.

[1]Read before the North Branch Philadelphia County Medical Society, March 19, 1907.

CASE IX.—T. C. Epididymitis after the passage of a bougie. Pain disappeared in six hours; testicle normal in six days.

CASE X.—H. J. Gonorrheal epididymitis of the left testicle; extremely painful. Complete relief in twenty-four hours. Discharged in five days.

CASE XI.—N. H. Epididymitis from instrumentation; very painful. No pain in three hours; normal in four days.

CASE XII.—A. P. Chancroidal bubo of right groin; so painful patient was unable to walk. Solution with moderate pressure. Relief from pain in four hours; patient discharged, cured, in five days.

CASE XIII.—A. S. No history obtainable. Pain and tenderness in both knees. L. and L. for two days; no relief. Magnesium sulphate solution applied, with complete disappearance of both pain and tenderness in forty-eight hours.

CASE XIV.—A. T. Gonorrheal epididymo-orchitis. Pain relieved in twelve hours; discharged, cured, in six days.

CASE XV.—C. H. Secondary syphilis. Pain and stiffness in both knees. The solution applied. Completely relieved in thirty-six hours.

CASE XVI.—J. B. R. Gonorrheal rheumatism. Feet, ankles, knees, one hand, and shoulder involved. Eight weeks' duration. Solution applied to all affected parts; gave relief in four hours. Had no pain in three days. Kept in bed ten days, when he was allowed to get up. Discharged, cured, in three weeks.

CASE XVII.—J. C. Pain, swelling, and tenderness in both knees, ankles, and right wrist. Relieved from pain within five days, but swelling and tenderness persisted. Placed on aspirin without effect. Then given sodium salicylate gr. xx four times a day, with slight abatement of swelling. The right middle metacarpophalangeal articulation then became inflamed and painful. The solution gave relief in five hours.

CASE XVIII.—P. S. Double gonorrheal epididymitis; more marked on the right side. Pain relieved in two hours. Discharged, cured, within one week.

CASE XIX.—J. T. Acute articular rheumatism; ankles, knees, wrists, and shoulders involved. Relief from pain in three hours. At first could not move joints. In twenty-four hours could move slightly without pain; in three days could move all joints without pain. No internal treatment given.

CASE XX.—J. G. Syphilitic testicle. Testicle about the size of a baseball, slightly tender and painful. Relieved in a few hours. Became reduced in size under specific treatment.

CASE XXI.—Gonorrheal epididymitis; very painful. Relief from pain in two hours; normal size in five days.

CASE XXII.—S. E. Referred from medical department, Philadelphia Hospital. Had been treated for rheumatism without relief. Placed in bed. Warm magnesium sulphate solution applied to affected parts. Salicylate pushed. K. I., gr. v, t. i. d. In bed two days. No pain. Allowed the freedom of the ward.

CASE XXIII.—F. B. Gonorrheal epididymitis. Pain only on pressure. Solution applied. Patient allowed to be up. No relief. Placed in bed. No pain in three hours. Discharged, cured, in five days.

CASE XXIV.—J. C. Gonorrheal epididymo-orchitis. Pain, swelling, and tenderness relieved in forty-eight hours.

CASE XXV.—H. B. Epididymitis following instrumentation for stricture. Pain relieved in three hours. Testicle normal in two days.

CASE XXVI.—E. J. Phipps Institute. Tuberculous peritonitis. Slight pain in abdomen. Hot water gave some relief. The day following severe pain. Magnesium sulphate solution gave complete relief in seven hours. No recurrence for six days, when severe pain developed. Died two days later. Post-mortem showed intestinal tuberculosis with perforation; acute peritonitis.

I have also used this treatment in three cases of gonorrheal rheumatism with good local results.

In two cases of facial erysipelas, one responded in forty-eight hours; the other in three days. In both the local pain was abated in a few hours.

One case of alcoholic neuritis of the lower extremities obtained relief in a few hours, but the solution had no curative effect.

Two cases of traumatic neuritis were likewise benefited. A case of acute inflammatory rheumatism involving the elbow-joints obtained relief from pain in less than twenty-four hours, with disappearance of swelling and redness in eight days. I have also tried it in two cases of sprained ankle with prompt results.

It has been used on simple contusions with marked benefit.

TECHNIQUE.

The application consists of a saturated solution of magnesium sulphate in water.

This solution is applied on from 15 to 20 thicknesses of ordinary gauze. This is saturated with the solution at least every half-hour, or as often as necessary to prevent drying, depending on the time of the year and the temperature of the room. The gauze is not removed until the end of twenty-four hours; the parts are then washed with water and the dressing reapplied if indicated. There is then found to be a marked blanching of the surface, which is, however, not followed by any deleterious effects.

The attendants who made the application complain that it causes a partial loss of sensation accompanied by tingling of the hands and arms, which persists for from twelve to twenty-four hours.

In the treatment of inflamed testicle, elevation was not used, other than to prevent wetting of the bedclothes.

Some cases, as noted in the preceding report, were kept in bed, while others were allowed the freedom of the ward.

In many cases no internal medication was given.

ANESTHESIA AND METHODS PRODUCING IT.

BY HENRY B. INGLE, M.D.,
Anesthetist, Gynecean Hospital, Philadelphia, Pa.

Anesthesia is a subject the importance of which has not been sufficiently appreciated by the medical profession of this country, and is only now beginning to receive the degree of consideration which it deserves. In the great majority of American hospitals the administration of the anesthetic is the duty of the youngest member of the house staff, and falls to him with the laboratory work and the taking of histories; and when he becomes a senior resident he is allowed to do the less responsible work of holding retractors or sponging after the surgeon's knife. In England, on the contrary, anesthesia is becoming a special branch of medicine, and each hospital has its staff anesthetist as it has its staff surgeon.

Any surgeon who has suffered the mental anxiety of performing an operation under the irregular narcosis of an inexperienced anesthetist, with the alternate fears of the expulsion of the intestines from the abdominal wound or the death of his patient, will appreciate how greatly the welfare of both the patient and himself is enhanced by the assistance of one who can relieve him entirely of that responsibility. Of course the direct responsibility is the surgeon's, and the anesthetist should be accountable to him; but the impatience of the surgeon should not be allowed to hurry the anesthesia, or push it beyond the limits of safety as judged by the anesthetist.

Any general narcotic must be considered as a toxic substance, which is used in surgical anesthesia to the point of partial intoxication, and only the one who is best

informed of the depth of the intoxication should govern its degree. The anesthetist and surgeon should work in harmony however, and the nature of the operation should dictate, other things being equal, the depth of the narcosis. For example, the degree of narcosis required for a plastic operation on the cervix and perineum should not be the same as that required for an abdominal hysterectomy, and yet if, in the plastic operation, divulsion of the sphincter is practiced, the narcosis should be more complete; and such relaxation should not be accomplished by suddenly crowding the anesthetic, but should be gradually induced by the anesthetist, who is conversant with the stages of the operation and knows when the deeper narcosis will be required.

The choice of the narcotic used should depend principally upon the condition of the patient, and to properly judge of this the anesthetist should precede every narcosis by a thorough examination of the patient and her history, including in his examination all laboratory aids available. In this examination the lungs, heart, and kidneys should receive special attention, for on them the toxic influence of the drug is most apparent. In this climate ether is the narcotic of choice, but I think that I detect a growing tendency among surgeons and anesthetists to use more chloroform; and the recent suggestion of Dr. Gwathmey, of New York, that the chloroform be heated to the temperature of the blood, may enable us to achieve the good results with that drug which our Southern colleagues claim.

Ethyl chloride, ethyl bromide, and nitrous oxide are all good for short anesthesias, or may be used preliminary to ether or chloroform.

The method of administration in its technical details is largely a matter of personal habit and preference. Abroad the use of more or less complicated apparatus for administering graduated mixtures of different narcotics with oxygen is almost universal, but I am informed that each anesthetist uses a different apparatus, usually of his own invention, so no one device is universally approved. To my mind the use of a closed face mask into which the patient exhales is a detriment even when oxygen is constantly administered; and if valves are used to obviate this disadvantage, it renders the apparatus too complicated for ordinary use, and too apt to be out of order when most needed. An anesthetist usually finds enough to occupy his attention in attending his patient without the added duties of watching three or four dials, valves, and stop-cocks; and if he is called to a private residence to anesthetize it would seem unwise to carry such a cumbrous machine with him. Then, too, the psychological effect of this formidable apparatus on a person already apprehensive of the ordeal she is about to undergo is far from advantageous. Alice Magaw reports 14,000 cases of general narcosis, and after this unparalleled experience recommends the ether drop method on the open mask, and this certainly is good evidence that the simpler method is "as good as the best and better."

She advocates close attention to the little details of the art, for art it is, and attaches especial importance to the effect of the psychological condition of the patient on the narcosis. In this I wish to most heartily agree, and will even go so far as to say that I consider it one of the most important factors in anesthesia.

The preliminary attentions to the patient are most important. The restriction of diet and purgation are too well known to need more than mention here. The anesthetist should, if possible, have previously examined the patient and secured her confidence; if this is impossible, his mien as he enters the room should be one of easy confidence and calculated to relieve her dread of the ordeal before her. It is wise to quiet the patient's fears before attempting narcosis. The preliminary administration of some sedative drug is an admirable expedient in the average case. Morph. sulph. gr. 1/6 and atropine sulph. gr. 1/150 are used with advantage by some, but are certainly productive of harm where lung complications are present or threaten. At the General

Memorial Hospital in New York scopolamine gr. 1/100 and morph. sulph. gr. 1/6 are given one-half hour before operation. The best drug in my opinion is chloretone, in doses of five grains every fifteen minutes for three doses, or in one dose of ten grains one hour before operation. With such preliminary medication the patient is less nervous, more easily anesthetized, the amount of narcotic used is less, and what is of great importance, the patient "dozes" quietly after recovery from the anesthetic, and postnarcotic nausea and vomiting are greatly decreased.

In all text-books the invariable rule is given to remove all artificial teeth from the patient's mouth before anesthesia, but often in old people wearing complete upper and lower plates the removal of teeth causes the cheeks to fall in in such a way as to interfere with respiration, and I have seen cases in which the alveolar processes were so absorbed that when the lower jaw was held up and forward, after the removal of the plates, the lips completely occluded the nasal orifices and effectually shut off the breath. Of course if the plate is small enough to be swallowed or interfere with respiration by becoming dislodged it should be removed, but in all cases common sense and not text-book rules should be our guide.

Having taken all preparatory precautions, the patient should be warned against the irritation of the throat so apt to occur with ether and assured of its harmlessness; the cone should then be lightly applied without any ether and the patient allowed to breathe through it until accustomed to its presence, during which time she should be instructed to breathe quietly through the nose and to keep her mind on something foreign to her operation "so that her dreams may be pleasant." The ether should then be dropped slowly on the top of the cone, or mask, and the frequency of the drops increased as she becomes more tolerant, but the ether should never be poured. In this manner complete anesthesia can be induced in from five to fifteen minutes and with from one to two and one-half ounces of ether, and with an entire absence of any choking, coughing, struggling, or any other unpleasant phenomena. If chloretone or morphine has been given, both the amount of narcotic and time required are greatly reduced.

With very nervous women, or when speed is imperative, ethyl chloride may be sprayed directly into the cone, and the ether dropped as before, thus reducing the time for inducing anesthesia to about five minutes. The patient should be placed on the operating table before the deeper reflexes are lost, and the anesthesia completed while the final cleansing of the operative site is being performed.

During the operation the anesthetist should endeavor to keep the patient at the highest level of narcosis which the operation will allow, and to maintain that level with the fewest variations possible and the least amount of narcotic.

Should the patient be alcoholic or maintain a high arterial tension with secretion of mucus and apparent intolerance of ether, the addition of a few drops of chloroform may reëstablish more favorable conditions, when the ether may be resumed. The excessive secretion of mucus which is so frequently encountered with alcoholics and negroes is a disagreeable complication and one which may seriously interfere with an even narcosis. I learned from my predecessor at the Gynecean Hospital a method of obviating this nuisance which I have seen used in no other institution and which may be new to some. This consists in pumping out the excessive secretion by utilizing the expiratory impulse of the patient to blow it through the nose or mouth. The lower jaw is grasped with both hands with the thumbs in front and the fingers around the angle of the jaw on either side. As the patient inspires the jaw is held up and forward, thus closing the mouth, but with expiration the lower jaw is gently but firmly forced downward and backward, thus partially closing the fauces and forcing the mucus through the pharynx and

nares in advance of the expiratory wave. In this manner, with the patient's head turned to one side, I have repeatedly seen a continuous stream of mucus coursing over the patient's cheek to a receptacle below, or removed by a towel as it emerged from the nares.

That a narcotized patient should be allowed to swallow her tongue is a reflection on the skill or vigilance of the anesthetist, for that accident is impossible if he constantly attends to his duty; and yet I have seen teeth pulled to admit the mouth-gag and the tongue held forward by a string passed through its body by anesthetists in large hospitals. I have anesthetized over 700 cases in the past two years, and have never used either the mouth-gag or tongue forceps.

Of the accidents of anesthesia and their treatment, I have nothing to suggest, except that the administration of anesthetics by trained anesthetists is sure to decrease their frequency.

The condition of the air in the operating-room is very important, and we should be as careful to insure its purity as its warmth. The humidity is a potent factor for good or ill, and is generally recognized as such. I was informed by two Southern surgeons that they postponed an operation of choice in their hospital if the weather was inclement, because of the increased danger from chloroform when the humidity was high. Certain it is that all general anesthetics inhaled as vapors are less well borne in humid weather.

In regard to postnarcotic vomiting and nausea, it is proportional in many cases to the amount of ether-saturated saliva which is swallowed, and in these cases lavage of the stomach gives marked relief. In ordinary cases, however, when ether is given as above suggested, the nausea is reduced to a minimum, and especially is this the case when chloretone has been previously administered.

Bronchitis and pneumonia, if caused at all by the narcosis, are due generally to either a chilling of the entire body surface by exposure or the administration of cold ether in such proportions that by its evaporation and consequent decrease in temperature it chills the lungs directly. The prevention is obviously secured by ample protection of the patient from draughts, and the drop method administration of warm ether by a skilled anesthetist.

RÉSUMÉ.

1. Narcosis is too serious a condition to be induced by any but those skilled in the art.

2. The anesthetist and surgeon should work in harmony.

3. The simple drop method on the open cone is the preferable form of administering ether.

4. The psychological state of the patient powerfully affects the narcosis.

5. It is not always necessary to remove false teeth.

6. New method of "pumping out" excessive secretion of mucus.

7. Mouth-gag and tongue forceps are rarely necessary.

8. The accidents and sequelæ of narcosis are best prevented by the drop method administration of warm ether by trained anesthetists.

THE PRINCIPLES OF TREATMENT OF RENAL INSUFFICIENCY.

In the *American Journal of the Medical Sciences* for December, 1906, PREBLE in an article on this topic reminds us that as toxic bodies are introduced with our food or medicine and others are produced within the gastrointestinal canal, the regulation of diet, therefore, is of major importance. Foods containing undue amounts of toxins, such as the various parenchymatous organs used for food, the various forms of game, foods which are highly seasoned or contain large amounts of blood pigment, should be limited. For other reasons, foods containing much salt are to be avoided.

The best food is milk. It is not toxic, its molecular concentration is less than that of blood, and it is poor in chlorides. There

are, however, some objections. It is deficient in certain food elements, faults easily corrected by the addition of cream and cereals; it contains an excessive amount of phosphates; and still more important, it is subject to fermentation within the gastrointestinal tract.

The second important external source of toxins is the gastrointestinal tract. Fermentative processes of many kinds go on here, producing bodies of great variety, some of which are toxic. Fermentation within the canal must be limited, as far as it can be, by employing foods least likely to ferment. In addition, intestinal antiseptics of various sorts have been employed, but in using them care should be taken to avoid those which in their excretion may irritate the kidneys. Equally important with the limitation of fermentation is the prevention of stagnation of the intestinal contents. Free purgation in these cases is demanded not only because the bowel bears something of a compensatory relation to the kidney, but because in this way absorption of toxins is lessened. It may even be possible that the latter factor is the more important of the two.

In exciting purgation it is better to use the vegetable rather than the saline purgatives, especially if large amounts are required, because the salines have the same influence upon the molecular concentration of the body fluid that sodium chloride has.

Before leaving the question of food supply and fermentation a word should be said of the necessity of individualizing. The diet suited to one patient will not do for another; moreover, each patient's diet must be modified from time to time according to his digestive capacity, the condition of his gastrointestinal tract, the presence or absence of edema, and other factors.

The production of toxic bodies by the organism itself cannot be prevented or lessened below a certain point, for their production is one of the manifestations of life itself. Something, however, can be done toward lessening their production by securing for the patient as perfect bodily and mental quiet as circumstances will permit. The disease itself will force a certain degree of quiet, but often the patients drive themselves to do much which could easily be avoided.

Having limited as far as possible the amount of toxic material introduced into or produced within the body, it remains to lessen its effects by hastening its removal. As already stated, the relative importance of these measures varies and increases with the degree of renal insufficiency. In the milder cases moderate purgation and sweating are sufficient, but in severer cases there is nothing so useful as venesection. The amount of blood withdrawn and the frequency with which the venesection should be repeated depend on the size of the individual and the severity and persistency of the symptoms; but in all cases the phlebotomy should be looked upon as the first resort rather than, as it now too frequently is, the last resort. Bleed early and as often and as much as the symptoms demand. The bleeding is done for the distinct purpose of removing as large an amount of toxic bodies as is possible. It is not done for the purpose of lowering the blood-pressure directly, and should not be reserved for cases with high pressure.

The sweating and purgation are far less effective; indeed, it is likely that the only thing accomplished by sweating is the removal of water. These methods do slowly and incompletely what the phlebotomy does quickly and more effectively. Bouchard estimated that 32 grammes of blood removed more toxins than 280 grammes of fluid feces or 100 liters of perspiration.

In addition to the mechanical removal of the blood, mention should be made of the withdrawal of fluid from the thoracic or abdominal cavity, or from the edematous leg, by hollow needles. The paracentesis is sometimes literally a life-saving operation, the lungs and heart laboring under such conditions that their immediate relief is imperative. Recently the withdrawal of fluid from the cerebrospinal canal by lumbar puncture has been advocated and employed with some asserted good results, but the author has found nothing but failure.

EDITORIAL.

CAN A SPECIFIC DISEASE BE ABORTED?

The question as to whether a disease due to a specific infection can be aborted by any plan of treatment at present known to the medical profession is one which arouses great interest and affords a timely topic for discussion. Prior to our present knowledge concerning the relationship of microörganisms to disease many skilful practitioners of large experience were firmly convinced that it was in their power to abort a number of diseases which we now know are distinctly specific in their origin. In most of these instances the condition was recognized as being actually inflammatory in its nature, but with the discovery that the acute inflammatory process depended upon an infecting microorganism, the belief that the disease could be aborted was diminished because the measures which had been resorted to in no way directly influenced the pathogenic microörganisms. It would seem probable at the present time that while our predecessors were too enthusiastic in their belief that they could abort specific diseases, the physician of the present day is too pessimistic concerning his abilities along these lines, for while it is true that it is practically impossible to influence pathogenic microörganisms in the body by the administration to that body of drugs, it is also beginning to be recognized that remedial measures may so influence the body as to stimulate its abilities to cope with microbic invasion.

Three years ago the writer of this editorial published in the GAZETTE a research in which it seemed to be pretty well proved that the administration of alcohol in proper medicinal quantities in the course of prolonged infectious diseases distinctly increases the ability of the body to destroy infecting microörganisms—in other words, it seemed to materially increase the bacteriolytic power of the blood. Another instance founded upon wide clinical observation, but not upon scientific research, is the wide-spread belief that proper doses of quinine taken in the early stages of an acute cold, or in the early stages of influenza, distinctly modify or abort the disease, particularly if in the latter disease the salicylates are also employed, and of course we have several other instances in which a true specific influence is exercised, as in the case of quinine in malarial infection, the salicylates in acute articular rheumatism, and the use of mercury in syphilis. The actual proof of the mode of activity of the salicylates and mercury in the last-named diseases still awaits, of course, the decision on the part of the pathologist that a definite and specific microörganism is their causative factor. A number of similar instances might be named, but they are unnecessary because those already mentioned serve to illustrate our meaning.

We have read with a great deal of interest in the *Boston Medical and Surgical Journal* of January 31, 1907, an article, bearing the title found above this editorial, by Dr. J. M. French, of Milford, Massachusetts, who begins his paper by carefully defining what is meant by a "specific" or "pathogenic" disease, and what is meant by the word "abort." He admits that the weight of authority is decidedly against the possibility of aborting specific disease, and that it is almost universally assumed that a disease which has once gotten fairly under way must of necessity go on its course uninfluenced by medical treatment. He further points out that any one who makes a claim that a disease has been aborted is exposed to the accusation of having made a wrong diagnosis. Another point of importance which he emphasizes,

however, is that nature itself often aborts disease, and this leads him to a belief which we have already stated, that if nature can abort specific infection it may be quite possible for the skilful physician to so aid nature as to enable the system to successfully cope with pathogenic infection. That nature does abort specific disease in many instances is, we think, the experience of every active practitioner. Thus, it not infrequently happens that the crisis of pneumonia appears as early as the third day. It may be stated, on the one hand, that this is due to a mild infection, but there is no proof that it is not due to an ordinary infection which has been successfully opposed by great vital resistance. Again, many cases of coryza can certainly be aborted during the first twenty-four or forty-eight hours if they are properly treated, and we firmly believe that all these instances of coryza are distinctly infectious in their nature; and diphtheria can certainly be aborted if the antagonistic powers of the body are aided by the injection of antitoxin, which, acting with the ordinary antitoxin of the patient's blood serum, wins the day.

An immense amount of evidence can be adduced that the body possesses a host of measures for its own protection. In some instances protection is afforded by the action of antitoxin; in other instances by the ability of the blood serum to destroy and dissolve microörganisms; in still other instances the battle is won by the aid of phagocytes; and in some cases doubtless all these factors join together in protecting the system from disease. Again, it is well known that large capillary areas possess greater power in destroying toxic materials, whether these capillary networks be in muscular tissue or in the liver. And, again, it is a well-recognized fact that specific inflammations produced by many microörganisms are accompanied by the accumulation of an immense number of leucocytes and phagocytes, and by the presence of large quantities of bacteriolytic serum which at once flood the area to destroy its invaders. Finally, we all recognize that certain individuals in a good state of health are able to combat infections which others in a depraved state of health cannot withstand, and we are wont to speak of this state as one of high or low vital resistance. All these facts seem to us to point, therefore, to the conclusion that it is possible by proper remedial measures to aid the system in aborting specific diseases. The wide-spread use of Dover's powder, hot drinks, and sweet spirit of nitre in the early stages of acute colds, which proves that they produce good results in a certain proportion of cases, is we think an indication of the ability of based upon scientific research his ability to combating infection.

It is quite true that from the standpoint of the strictly scientific laboratory worker there is little evidence to prove the correctness of these opinions. No one has greater respect for laboratory investigations, and the conclusions which can be drawn from them, and no one recognizes their importance more fully than the writer, but every practicing physician knows full well that were his means of treatment cut down to and limited to those measures which are based upon scientific research his ability to treat disease would be very limited.

It is our duty to study this matter of the ability of the body and the physician to combat specific infection, and to endeavor, if possible, to reach more accurate and less empirical results than we have at present. We should endeavor, whenever possible, to find for our methods a scientific basis, and where this cannot be found to employ empirical measures which have been found useful until a scientific explanation is forthcoming. We are glad to find that Dr. French holds views very similar to our own, for he concludes his paper with these well-chosen words: "Is it not better to admit the possibility of improvement, and then go to work with all our might to make the possibility a reality, instead of spending our time in crying out, 'It is impossible, it is absurd, it cannot be done'—a cry which has been uttered in the face of all progress since time began."

THE PERSONAL EQUATION IN THE TREATMENT OF DISEASE.

One of the strongest arguments against the employment of ready-made formulæ lies in the fact that by their use the physician is prone to practice medicine by a routine method rather than by careful analysis of the needs of every case which comes under his care, for a ready-made formula necessitates the administration of identical doses in every case, whereas the prescription which is written for the patient immediately under observation naturally varies in the quantity of its ingredients according as to the predominance of certain symptoms. Not only is routine practice, without careful observation of the idiosyncrasies of the individual patient, a thing to be condemned for the reason just given, but also because it changes the practice of medicine from being an intellectual pursuit to that of a humdrum method of existence. It is only by the constant exercise of an active mind that the peculiarities of disease in individuals can be carefully estimated, and a mind which becomes inactive through disuse along these lines is not, at the end of a number of years, fully qualified to deal with the very complex problems which continually present themselves to physicians. Many years ago Moxon said, "It is as important to know what kind of a patient the disease has got as to know what kind of disease the patient has got," and perhaps we may add to this aphorism that much depends upon what sort of a physician is attending the patient. While it is perfectly true that certain of the manifestations of disease must be directly attacked by therapeutic measures, it is equally true that the patient must be treated rather than the disease itself, and, as we have so often emphasized in these pages, it is essential to remember that in a large proportion of instances the system of the patient is better qualified to deal with a disease, if left to itself, than if it has to withstand at the same time meddlesome interference.

By the exercise of the mental acuity which is essential to success in dealing with the questions which constantly arise in his professional life the physician has an opportunity of enjoying his career, whereas routine methods are quite capable of making his life intolerably stupid and dull. As Osler has well said, "the practice of medicine is very much as the physician makes it. To one it is a worry, a care, and a perpetual annoyance; to another, a daily joy, and a life of as much happiness and usefulness as can well fall to the lot of man;" and, again, he emphasizes the maxim of Moxon when he says that "we must learn to appreciate the differences between the description of a disease and the manifestations of that disease in an individual."

ANOTHER REPORT UPON THE RELATIONSHIP OF QUININE AND HEMOGLOBINURIA.

Readers of the THERAPEUTIC GAZETTE during the last fifteen years are well aware of the fact that this journal has during that time provided them with considerable information in regard to this important question. Within the last year or two it has not only taken the stand that quinine is capable, under some circumstances, of inducing hemoglobinuria, but that it should be given to patients suffering from this condition only when an examination of the blood reveals the presence of the malarial parasite. It should not be given in those cases in which the patient is suffering from malarial cachexia without actual presence of the malarial germ. Our attention has once more been called to this matter by an article by Ketchen, which appears in the *British Medical Journal* of November 10, 1906, which records his experience in Cape Town, Africa. In his report the fact seems to be proved undoubtedly that hemoglobinuria invariably followed the administration of quinine, even if it was given in small dose, and even after the patient had been free from any acute attack of blackwater fever for

fourteen months. Ketchen then recites the investigations of Koch, Plehn, and others in support of the idea that there is a direct relationship between the administration of quinine and the development of this symptom, and we are quite in accord with this belief. The point is also brought out, which we have called attention to in these columns, that the hemoglobinuria may perhaps depend for its existence upon the presence of some other parasite in the blood which is not yet recognized, and in fairness to the subject he quotes Manson and the writer of this editorial as advocating the use of quinine if the malarial parasite is found in the blood, and in withholding it if no such positive discovery is made in those patients who give a history that its use produces this symptom.

INTOLERANCE OF FATS.

We have read with a great deal of interest a most interesting and valuable article on this subject, by Edsall in the *Boston Medical and Surgical Journal* of December 23, 1906, in which he discusses in an exhaustive and lucid manner the inability which many persons have to digest fatty foods. One of the important points which he emphasizes is that in the endeavor to make certain persons gain in weight physicians and the laity are very prone to order quantities of fat which are quite beyond the abilities of the patient to utilize. Indeed, in many instances one of the reasons why the patient is thin is not that there is an inadequate quantity of fat in the food, but an inability on the part of the organism to utilize the fat which is ingested. Not only is this true, but there can be no doubt that the taking of considerable quantities of fatty food is not only capable of disordering digestion but also of seriously interfering with nutritional, or metabolic, processes in the body, and with our increasing knowledge of metabolism in diabetes it is evident that it is quite possible that the too free use of fats may produce serious conditions. One class of cases in which fatty indigestion is by no means uncommon is found in infancy, in which the use of too much cream and milk, or too much fatty food of another character, not infrequently results in looseness of the bowels associated with curdy masses in the stools, which indigestion is usually credited to casein and not to fat. In other instances the child is inordinately constipated, and hard, dry stools, consisting largely of soap, are passed by the patient.

Gastric disturbances from the ingestion of fats are also by no means uncommon. In this connection we must consider the influence which fats are supposed to exercise upon gastric hyperacidity. In some instances it is, of course, true that the generous use of fats diminishes hyperacidity. But on the other hand there are some cases in which their use greatly increases the sense of discomfort, of burning, and of acid eructation, which symptoms entirely disappear when fats are removed from the diet list. So, too, some of the cases of cyclical, or recurrent, vomiting seem to have their origin in an excessive use of fats; the word "excessive" being applied with equal correctness to persons who cannot digest small amounts of fats as to persons who rebel when large quantities are given.

In many cases of jaundice and hepatic inactivity arising from other causes fats should be absolutely removed from the diet; and this becomes evidently important to remember when we recall the fact that some of the cases of recurrent vomiting are perhaps due to acid intoxication.

The examination of the stools for the purpose of determining whether there is an inability of the digestive apparatus to deal with fats is not as satisfactory as it might be, and the methods of inspection and analysis which are commonly employed by busy practitioners are quite inadequate to determine the quantity of fat which escapes from the bowel with any accuracy.

In some instances it may appear from a superficial examination of the patient's diet list that fats are not being taken in any quantity which can be considered deleterious, but a careful examination of the sub-

ject will reveal the fact that they are nevertheless ingested in greater proportion than the patient can handle. Thus, there are a certain number of persons who are unable to digest the yolk of eggs chiefly because of the fats which they contain, these people being quite capable of digesting the white of eggs.

This whole subject is one which requires careful and accurate investigation. There is no doubt that it has been greatly ignored in the past, and that at the present time our knowledge concerning it is very crude as compared to our knowledge of the digestion of starches and proteids.

THE TREATMENT OF SHOCK.

That the value of the lessons taught by Crile in his experimental and clinical work on shock has been taken to heart is well shown by a symposium on this subject in the *International Journal of Surgery* for February, 1907. It is noticeable that all the authors, including Dawbarn, Wainwright, Gwathmey, Herrick, and Hammond, practically reject drugs, with the single exception of morphine. In strict accordance with Crile's findings they are particularly opposed to the use of strychnine, agreeing thoroughly with the dictum that if this drug has any effect in shock it is hurtful rather than beneficial.

Dawbarn, who does not differentiate between shock and hemorrhage, particularly insists upon the value of intravenous injections of hot saline solution, injecting into the long saphenous vein because of its size and ease of access solutions at a temperature of 118° to 120° F., and advising that these be given at the proper time, namely, upon the operating table and before the shock has shown itself. He holds that if the shock strikes first no therapeutic means are of avail. He urges that the dose must be repeated to maintain its good effect. For this purpose he ties a cannula with stop-cock in the vein; to the latter at intervals an irrigator is attached. He cautions against the introduction of more than a few ounces at a time after the primary two quarts, and believes the addition of a little adrenalin chloride to the solution is distinctly serviceable.

In operating upon the head and neck he is opposed to even temporary clamping of the carotids, but resorts instead to cording of the limbs to accumulate blood in them.

As a further means of combating shock he strongly advises if operations are prolonged that they should be performed in sequence—*i.e.*, that an opening of the skull should be done one day, and at a later period, when the patient has thoroughly recovered from his first operation, the cerebral part of the operation should be completed. He also mentions cocaine blocking as a means of avoiding shock, since this condition is due to sensory impulses which exhaust the vasomotor center in consequence of the primary stimulation. He notes, however, that after the effect of the cocaine has passed off shock will develop, and it would seem probable therefore that with some chemical less evanescent in its effects than cocaine or tropacocaine or stovaine we may give these vital centers more time, and so save some patients who now die.

Wainwright on the basis of an experimental and clinical study is enthusiastically in favor of local blocking or spinal anesthesia as an absolute inhibitor of shock. He finds in ether a drug which in itself is capable of producing a condition of shock, and concludes his article by the statement that "the time has come when none of us can justify ourselves either in our own minds or in the courts if we lose an amputation case and have not employed these simple and thoroughly demonstrated means to give our work the greatest degree of safety. The fatal nerve impulses must be blocked either by seriatim injection of the important nerves or by spinal analgesia. I feel that the time is at hand when the procedure in my last case noted will be the usual one. This is: no ether, formal exposure, injection of the

large nerve trunks, and temporary ligation of the main artery."

Gwathmey, who is anesthetist to the Gouverneur, the New York, Skin and Cancer, the City, and the Polyclinic Hospitals, states that in hundreds of cases in which anesthetics are given, over 50 per cent are shocked more or less from the anesthetic. He states that in all major operations the injection of normal saline solution per rectum, before the patient is taken from the table, and inhalations of oxygen for thirty minutes after the operation is concluded, are measures intended to assist in getting rid of all the anesthetic that may still remain in the blood, thus preventing postoperative shock. He also advises that as soon as consciousness returns the patient should be allowed to drink as much water as is desired. If it is vomited the stomach is washed out; if it is retained the patient is in better condition with the diluted ether saliva than if the water had not been taken. With the anesthesia properly induced and maintained he holds that there is a tremendous strain upon all the vital functions; to avoid all shock after the operation the room should be darkened, quiet maintained, and the patient allowed to sleep until he awakens naturally. The patient should be able to answer questions intelligently within fifteen minutes after the conclusion of the operation.

Undoubtedly the greatest advances made in modern times in the treatment of shock are in the direction of prophylaxis. The avoidance of hemorrhage, the preservation of the body heat, deft and rapid operating, the limiting of incisions, rational preoperative preparation, including the insurance of the active functioning of the excretory organs, and, perhaps most important, the tendency to select skilled anesthetists, are factors in the general lessened mortality from shock.

The blind enthusiasm for strychnine in the treatment of shock when once developed, an enthusiasm which still swells the mortality in many hospitals, is an evidence of the power of habit and accepted usage.

When shock is incident mainly or entirely to hemorrhage the intravenous injections have proven their value. A still more serviceable procedure, one distinctly live-saving in desperate cases, is that of blood transfusion by suturing an artery of the donor into the vein of the donee. This Crile has shown to be perfectly feasible. In the ordinary conditions of shock following prolonged operation Murphy's slow rectal injections of normal saline, combined with elevation of the foot of the bed, are usually adequate. As a means of determining the onset of shock the careful observation of a skilled anesthetist should prove adequate for ordinary purposes. It is desirable, however, that this should be supplemented by a sphygmomanometer. The Riva-Rocci form is so cheap and so readily adjusted that it should form a part of every clinical armamentarium.

HERNIA IN CHILDREN.

Hernias observed in children are usually of the umbilical and femoral variety. Though there are many individual cases of femoral hernia reported this condition is comparatively rare before the age of puberty. Those who have much to do with the surgical treatment of children are struck by the number of cases which present themselves with hydrocele of the cord, and which have nearly always been treated as though this condition were hernia. This perhaps is the only condition, certainly the only condition in infancy, which is likely to lead to error. The umbilical hernias rarely call for operation, being readily cured by pressure, best applied through the medium of a flat surface secured in position by an adhesive strap.

In regard to the inguinal hernias, however, the general opinion of the profession is undergoing a change. It was formerly held that the great majority of such ruptures could be cured, and permanently cured, by a properly fitting truss. That many can be so cured is beyond question. As to whether or not this cure is a per-

manent one is open to considerable doubt. There can be scarcely any question but that many of the hernias occurring in later life are the sequelæ of a congenitally patulous condition of the vaginal tunic. Moreover, large experience in the operative treatment of infantile hernias has proven that the surgical procedure is practically devoid of danger, and gives even better results than does this operation when practiced upon the adult.

Clogg (*British Journal of Children's Diseases,* No. 9, vol. iii, 1906) has contributed an admirable article upon the subject of children's hernias in which he states that Cushier has reported a femoral hernia in a fetus, that Coley's youngest femoral hernia was two months old, and that Bull in a series of 1500 cases of hernia in children notes that 15 were of the femoral type.

Hernia of the obturator type is still more rare, though Berger saw one in a child two years old.

In the umbilical hernias of children two types are recognized, congenital and the infantile. As to the frequency of this defect, it is estimated that about one out of every 5000 children exhibits it.

The congenital hernia depends upon arrested development of the abdominal wall. The peritoneal investment is lacking, the viscera being covered only with amnion. Such hernias must necessarily be present before the third month of intrauterine life. The type which is of surgical interest contains a coil of intestine with or without the omphalomesenteric duct or its remains, adherent on the inner surface of the sac. The congenital umbilical hernia forms after the third month of intrauterine life at the time when the peritoneum covers the umbilical ring. The peritoneum and the amnion are united by connective tissue, often of a gelatinous nature. Small hernias of this kind, often called hernias into the umbilical cord, contain a coil of small intestine with or without diverticulum, and are often associated with other deformities. The diagnosis is usually perfectly obvious, and the treatment should be by operation.

Infantile umbilical hernia appears some days or weeks after birth and is due to imperfect closure of the umbilical ring. It is usually noted in the weaker, *i.e.* the upper, part of this ring, and is especially likely to develop in feeble, rickety children. Divergence of the recti is rarely noted. Strangulation is extremely rare and cure is generally accomplished simply by pressure. Clogg reports a case of strangulation in a child fifteen months old, and Turner a case seventeen months old.

Direct inguinal hernias are extremely rare in children; neither Bull, Coley, nor Carmichael have noted a single case. Oblique inguinal hernias are classified as acquired and congenital. The development of acquired hernia implies weakness of the abdominal muscles, peritoneal bulging occurring at the weakened spot. In children such weakness does not exist, the internal oblique muscle being very well developed. In large hernias such weakness, if it be found, is the effect of the hernia rather than the cause. The sac in children may be regarded always as congenital.

Clogg classifies these oblique inguinal hernias as partial funicular and total funicular, the total being one in which the processus vaginalis is patent, the partial one in which the processus vaginalis is obliterated at some part and its upper portion only forms the sac. In the encysted type of sac the processus vaginalis is obliterated at a spot some distance above the testicle, and a partial funicular sac bulges into a capacious tunica vaginalis, which may or may not contain fluid.

Clogg points out that the popular conception that the sac in infancy and childhood is a total one is entirely wrong. In a series of 100 operations upon male children (excluding, of course, those cases associated with an imperfect descent of the testicle) Clogg found a total sac in only seven. Carmichael found a total sac in seven cases out of 133 radical cures performed, whilst Campbell estimates a total sac in about five per cent of cases. The most frequent form is the partial

funicular sac. The cecum is a fairly frequent content of the right hernial sac. Of great interest are those cases of cecal hernia with an incomplete sac, variously called "congenital cecal hernia" or the "sliding" type of hernia. In this variety the cecum raises the posterior wall of the sac, the peritoneum is reflected from the sides of the cecum to the sac wall, leaving the posterior aspect of the cecum uncovered by serous membrane. This uncovered area may extend some distance into the scrotum. These cecal herniæ are often irreducible, are difficult to retain by a truss, and not infrequently become incarcerated or even strangulated.

Stiles found the cecum present in the sac in seven per cent of his cases. In all of these the sac was complete, while in two instances the lower end of the mesentery was attached to the posterior wall of the sac and had to be divided before the bowel could be returned within the abdomen to enable a ligature to be put sufficiently high around the sac. The sliding type of cecal hernia can be expected to relapse more frequently than those hernias with a complete sac, since there is no neck to close and the peritoneum around the internal abdominal ring cannot be made taut.

Hernia of the bladder may develop without a sac, a rare variety in which the anterior or lateral surface uncovered by peritoneum enters the inguinal canal; with incomplete sac, in which the bladder raises the sac-wall, and is only covered on one aspect with peritoneum, the common type; and with a complete sac, a very rare form, in which the protruded portion of the bladder is completely surrounded with peritoneum.

It is fairly easy in isolating the neck of the sac and dragging upon the peritoneum to draw the bladder into the wound. It is usually preceded by a mass of peritoneal fat, which should be regarded as a warning that further traction will be likely to expose the bladder wall.

Two instances of tuberculosis of the sac are reported by Clogg. He also records eight cases of strangulation, the youngest being five weeks old. Usually the reduction under ether is simple. This accident occurs within the first twelve or eighteen months of life, usually within the first six months.

The treatment of infantile hernia is operation, usually after the sixth or eighth month, unless this entails weaning of the infant. The indications for operating earlier are strangulation or symptoms threatening this condition, large size of hernia, or impossibility of retaining by a truss. Clogg states that if the baby be bottle-fed the operation may safely be undertaken in the fourth month.

Clogg incises the external oblique from the apex of the external abdominal ring upward and outward a little distance above Poupart's ligament, believing that the internal ring cannot be sufficiently exposed without freeing the inguinal canal. The sac is readily identified by stretching fully the tissues of the cord and incising the cremaster fibers which spread out over it. The sac is opened, and the cord is easily separated. The sac is freed up to the internal ring, is drawn upon, freed about the neck, clamped, twisted, ligated, and removed. An excess of subperitoneal fat on the inner side is taken as a warning that the bladder is near. A total funicular sac is divided a little below the external ring, the scrotal part being allowed to remain without further attention. In the majority of cases with a well-developed internal oblique Clogg passes a couple of sutures through it, the torn cremaster, and Poupart's ligament over the cord. In large hernias and those where the internal oblique has been weakened, a more secure wall is made by suturing these structures behind the cord. The cut margins of the external oblique are either sewn together or, if this tendon is lax, are overlapped by two layers of sutures. A deep suture is then employed in the subcutaneous tissue to avoid any reactionary hemorrhage, which may readily occur from the thick layer of subcutaneous fat developed in this region in infants. The skin edges are approximated by a subcuticular suture.

REPORTS ON THERAPEUTIC PROGRESS.

FURTHER OBSERVATIONS ON THE USE OF ADRENALIN IN PLAGUE.

CHOKSY in the *Indian Medical Gazette* for February, 1907, reminds us that in a previous communication to the *Indian Medical Gazette* preliminary observations with adrenalin in this disease were related. They indicated that adrenalin exerted a distinctly beneficial effect upon the circulation by increasing the pulse tension, remedying its irregularities and steadying and sustaining the action of the heart, until such time as the system was able to eliminate the toxins, and bring about recovery. The full measure of the effects of the drug could not, however, be demonstrated, inasmuch as it was tentatively employed and other drugs were simultaneously used. Nor was it then possible to determine in what doses and with what frequency it could be exhibited; the limit of its usefulness, as also of its tolerance, and finally its ill effects, if any, had to be established. Further observations were therefore undertaken at the Maratha Plague Hospital during 1905, when adrenalin was used throughout the whole period of the epidemic, and certain data having been obtained, its use was still further extended during the epidemic of 1906. It is the purpose of this article to summarize the results of the above observations.

The main object of the observations, in 1905, was to compare the effects of small, medium, and large doses of adrenalin, to fix the limit of the safest single maximum dose, to determine the frequency of its administration, and to record its after or ill effects. Correct records of the amount administered and its frequency were kept and the effect upon the circulation carefully noted. As during the height of the epidemic Yersin-Roux antiplague serum was also employed, it was possible to institute comparison between those cases treated with the serum and adrenalin and those without. Full confidence having yet to be established in its utility, it was determined to use it simultaneously but in alternate doses with the stimulant injection previously described (strychnine, sparteine, and atropine). In order to allow of facility in administration and exact dosage, it was prescribed in the following formula:

℞ Adrenalin solution, min. 5;
Normal salt solution, q. s. ad f3j.

The initial dose of the above varied from one to three drachms every three or four hours according to the condition of the pulse. If there was no improvement, or if the pulse became steadily worse, the dose was increased from four to six drachms and the frequency to two hours. When so prescribed, it was not found practicable for various reasons to administer twelve doses in the twenty-four hours, and the daily average in grave cases therefore came to about ten doses, equivalent to about 300 minims of adrenalin solution. This maximum dose was kept up for three or four days, sometimes longer, and after the pulse exhibited sustained improvement it was gradually reduced by one drachm at a time, and subsequently at longer intervals. The doses were gradually decreased as the patients' condition improved, and in by far the largest number of cases it was entirely stopped by the end of the second week. Even after sustained improvement in the condition or the circulation, it was found that abrupt stoppage or too great a reduction in the dose was not safe. It soon reacted unfavorably upon the pulse, necessitating increased dosage. The decrease should therefore be always gradual, and its effects require careful watching. If the maximum dose failed to have any effect, the condition of the patient was practically hopeless. In those cases in which the circulation did not improve, notwithstanding the disappearance of all acute symptoms and general amelioration, it had to be kept up, and some patients received adrenalin in small doses for periods extending from six to eight weeks without any apparent harm.

In order to grasp fully the results obtained under the above method, it would be necessary to revert for a time to the results of the previous observations of 1904, which were as under:

Line of treatment.	Number.	Died.	Recovered.	Case mortality. Per cent.
Stimulant and camphor injections	324	268	56	82.7
Stimulant injection, adrenalin (by mouth)	598	416	182	69.5
Adrenalin only (mostly subcutaneously)	70	47	23	67.7

The above statement indicates that adrenalin used by itself had greater influence in lowering the mortality than when employed simultaneously with the stimulant injection, and further that the combination of stimulant injection and adrenalin showed better results than the older method of treatment by stimulant and camphor injections only. The results of the observations of 1905 may now be stated as follows:

Line of treatment.	Number.	Died.	Recovered.	Case mortality. Per cent.
Stimulant injection plus adrenalin	1038	810	228	78.0
Adrenalin injection plus Yersin-Roux serum	222	188	84	62.1

The foregoing table demonstrates that the combination of adrenalin and serum exhibited the best results, as also the fact that among the cases treated without the serum the results, although less favorable than those of 1904, were still better than under the older plan of treatment. Included in the above series are 241 cases to whom adrenalin was administered subcutaneously in doses of 10 minims mixed with an equal quantity of normal salt solution, eight to ten times during the day, the stimulant injection having been administered by mouth with water. The effects of this method of exhibition were not so marked, and the mortality was higher by nearly 7 per cent.

The above results, if analyzed according to the doses administered, and their frequency, furnish some instructive data. As the ultimate fate of every plague patient depends upon the extent of the cardiovascular paresis and of the degenerative changes in the myocardium as well, the action of any drug, however potent, is subject to considerable limitations. Given a moderate degree of toxemia and early treatment, a drug would exert far better effect and in much smaller doses than under other circumstances where these conditions do not prevail. And it has also to be recognized that the response from powerful stimuli would not be so rapid nor so durable where degenerative and paralytic changes have advanced far. Nor can any drug counteract such tissue changes as have been already brought about by the toxemia. Thus out of 1019 patients who received adrenalin by mouth, it was only in 144 that the conditions could be said to have been at all favorable, and where moderate doses of adrenalin varying from 5 to 15 minims had the desired effect. The rate of mortality among them was 37.5 per cent only. On the other hand, 875 patients received large doses, varying from 20 to 30 minims every two hours; 451 patients could be kept alive under them for two days, 297 for five days, and 127 patients for six days and over. The rate of mortality among them was 883—71.1 and 65.5 per cent respectively. That is to say, in more than half the number of cases the circulatory system was so gravely affected that adrenalin could sustain the heart's action for about two days only; on the other hand, where the conditions, though grave, were more comparatively favorable, life could be prolonged for five or six days or even longer and a few more lives eventually saved. The sustaining action of adrenalin is thus well demonstrated:

Dose of adrenalin in minims.	Number.	Case mortality. Per cent.
5 to 15	144	37.5
20 to 30: administered		
for two days	451	88.3
for five days	297	71.1
for six days and over	127	65.5

The above figures indicate the gravity of the cases dealt with, and the narrow borderline that always exists between life and death in plague. The main purpose of the

above observations having been thus served, greater confidence was established in the usefulness of the drug, and it was resolved to employ it solely during the epidemic of 1906. The stimulant injection was therefore discarded; in those cases in which nervous prostration or coldness of the extremities required temporary stimulation, camphor injection was used. The only deviation in the method of administration was that instead of gradually increasing the dose of adrenalin from 15 minims upward, as the condition of the circulation grew worse, rather full doses were given initially, but in no case exceeding 30 minims every two hours. The effect of this was soon apparent upon the pulse, which became almost at once steady, and was maintained at a more or less uniform level throughout the acute period of the illness. If the pulse maintained this improvement for four or five days, the dose of adrenalin and its frequency were gradually reduced. The advantage of this method lay in the fact that the initial full dose steadied the circulation and prevented its getting worse, and thereby saved the heart, and finally it contributed to a greater saving of life. The above method was carried out from January to June of the past year, and comprised 802 cases, of whom 575 died and 227 recovered, equivalent to a case mortality rate of 71.6 per cent. From June to October 102 patients were treated with adrenalin administered subcutaneously in doses of 20 minims every two hours, the patients, however, receiving ten doses only in the day, equivalent to 200 minims of the drug. There were 65 deaths and 37 recoveries—that is, a case mortality of 63.7 per cent. If we now tabulate the above observations extending over three epidemics, we see how the results have worked out under the varying methods of treatment:

Line of treatment.	Number.	Died.	Recovered.	Case mortality. Per cent.
Adrenalin (by mouth), stimulant injection	1636	1226	410	74.8
Adrenalin (by mouth)	787	571	216	72.5
Adrenalin (subcutaneously)	157	105	52	66.8
Adrenalin, Yersin-Roux serum	252	152	100	60.3

The adrenalin when used by itself has given better results than when employed alternately with the stimulant injection. The hypodermic method has much in its favor in view of the still better results, and finally the best results are seen under the combination of adrenalin with the Yersin-Roux serum. These observations having extended over three epidemics, it may be argued that the later and better results may have been due to lesser virulence of plague; that such was not the case is indicated by the following statement showing the number of attacks and deaths reported in Bombay:

Year.	Attacks.	Deaths.	Case mortality. Per cent.	Case mortality, excluding patients treated in the Plague Hospital.
1904	15,488	13,538	87.40	89.20
1905	16,308	14,198	87.06	88.43
1906 (8 mos.)	11,864	10,456	88.13	90.34

The general mortality rate has been about the same, if at all a trifle higher during 1906; if hospital cases were to be excluded, the normal plague mortality would be between 89 and 90 per cent, a truly appalling rate, indicating the extreme virulence of the affection in Bombay.

VERTIGO.

In the *Kansas City Medical Index-Lancet* for November, 1906, ROBINSON says that the treatment of vertigo is the treatment of the morbid state which is causing the vertigo. If ocular, correct the error of refraction or the muscle incoördination. If gastric, correct the digestive disturbance. If hemic, correct the morbid state of the blood or the weak heart action, or, as far as possible, stop movements that bring on the vertigo in anemia resulting from arteriosclerosis. In incurable organic brain disease, in which vertigo is a symptom, drugs such as the bromides, which decrease the irritability of the equilibratory centers, will be indicated. Aural vertigo resulting from impacted cerumen in the external auditory canal will disappear when the cerumen is removed.

Curable middle-ear disease occasionally

causes vertigo, and the vertigo disappears when this morbid state is cured. All forms of reflex aural vertigo can be relieved by correcting the morbid state causing the vertigo.

Vertigo resulting from the morbid state of the labyrinth is the most difficult to treat successfully. There are many reasons for believing that these result from irritation of the vestibular nerve endings. If there be degeneration of any of the labyrinth structures, when the degeneration is complete the vertigo ceases. The bromides give considerable relief in these cases by lowering the irritability of the coördinating centers. In the very severe cases destruction of the entire middle ear may be done with satisfactory results. Charcot recommended large doses of quinine in chronic Ménière's disease. Church recommends pilocarpine in acute cases, and in obstinate chronic cases with impaired hearing removal of the malleus and incus and immobilization of the stapes will often give relief.

TREATMENT OF SOME EYE DISEASES BY THE GENERAL PRACTITIONER.

In the *Virginia Medical Semi-Monthly* WILKINSON discusses this subject and reviews the diagnostic points of the four conditions mentioned in his paper.

Conjunctivitis.—Always a discharge; pupil always dilates freely; cocaine dilates pupil; sensation of burning, pricking, and of foreign body; some photophobia.

Ulcer of Cornea.—Usually a discharge; great photophobia; the continuity of cornea has been broken at some point; there is usually a decidedly white, ulcerated spot. When there is any doubt as to whether the cornea is involved, this can be determined by instilling first a solution of cocaine, 2 per cent, followed in two to five minutes by an instillation of fluorescine, 1:100, followed again by a drop of cocaine. If there is an ulcer this will stain it yellow, and it becomes very distinct.

Iritis.—Small, usually ragged, irregular pupil; discolored iris, deep-seated inflammation; pupil not dilatable with 2-percent solution of cocaine; pain in eye and temple, worse at night; little or no discharge; normal tension; some photophobia.

Glaucoma.—Hard eye; great pain in eye and temple, sudden in onset; steamy cornea, slightly dilated pupil, but regular. Shallow anterior chamber.

In conclusion he offers a few don'ts in ophthalmology:

1. Don't treat an eye until you know what is wrong with it.

2. Don't use a poultice of any kind on the eye. Poultices have done more damage than they have ever done good. They mask the symptoms and cause rapid ulceration and breaking down of tissues.

3. Don't use atropine in the eyes of persons above the age of forty years, unless you are absolutely certain that you have a case of iritis.

4. Don't use acetate of lead in ulcers of the cornea. You will get a lead deposit in the cornea.

5. Don't use cocaine in ulcers of the cornea. It causes a degeneration of the epithelial membrane and invites ulceration.

6. Don't treat your chronic headache and migrainous patients for years with pills, purgatives, and coal-tar preparations, but send them to a competent oculist and have them fitted with glasses.

THE ADMINISTRATION OF CREOSOTE.

Creosote may be given in capsules, but, as has recently been pointed out by Dr. BOUCHET (*Progrès médical*, Sept. 1, 1906), the gelatin may dissolve in the stomach at a moment when the organ contains no food, or if the precaution has been taken to swallow the capsule only after eating, at such a point as to let its contents out against the bare wall of the stomach. In that case an irritant action must be exerted, possibly a caustic effect.

Apparently M. Bouchet has devoted a good deal of thought and care to the problem of administering creosote in an inoffensive manner. His investigations have led him to the conclusion that an excellent way is to mix the creosote with powdered charcoal in the proportion of one part of the former to two of the latter by weight.

Having been dried, the powder is done up in the form of wafers, each containing the proper dose of creosote. It might be preferable to put the powder into capsules as a mere matter of convenience. Several of them can be taken at a time if the dose is too bulky to be contained in a capsule small enough to be swallowed readily.

There is some loss of weight during the drying process, which lasts half an hour, no heat being used. One-sixth of the original weight is lost. Of course this loss is of creosote alone, though M. Bouchet suggests that the creosote simply parts with "humidity," and consequently becomes more concentrated. One might disregard that doubtful point, and adjust the doses to the patient's tolerance. Even the addition of charcoal does not render creosote wholly acceptable to the stomach, but it would doubtless do away with the irritation that might follow the administration of capsules filled with undiluted creosote. It is still better to incorporate the creosote with a generous amount of some bland substance, such as curd soap with powdered licorice or althea, and put the mixture at once into capsules.

THERAPEUTIC VALUE OF THE X-RAY.

EDSALL writes on this topic in the *Journal of the American Medical Association* of November 3, 1906. After discussing the points that should limit or discourage the use of the *x*-ray, he says that an agent that has such a profound effect on metabolism is not likely to exercise this effect solely in an evil way if proper opportunities for doing good with it are sought out. It is evident already that in leukemia and in some other general disorders metabolism may be stirred up by the *x*-ray to the accomplishment of at least transitory good, and it appears probable that some other disorders of metabolism not yet known to be benefited by the *x*-ray might be improved through its use. Up to the present the observations of the author in this direction, which have been limited in number and have been undertaken only in cases that seemed to be proper to subject to exposures, have remained of little or no therapeutic value, except in one condition, in which they have been quite encouraging.

He has had the *x*-ray used in two cases of gout, a disease that has repeatedly been treated in this way. The clinical results in other instances, as well as in these two cases, have been doubtful or discouraging. The studies of metabolism that he made with Dr. Fife in these two cases, during the time that they were under treatment, showed that the exposures had no influence in stopping or warding off the disturbances of metabolism that are associated with the attacks. Likewise, in two cases of diabetes that were subjected to this treatment, no changes of consequence could be demonstrated in the clinical condition or in the excretion of sugar and acetone bodies. He tried the effect of the *x*-ray, also, on a case of persistent headache associated with a deposit of oxalates in the urine, and while the increase in general metabolism that has usually been observed was noted in this case, there was no change in the amount of oxalic acid that was determined to be present and the clinical condition was not altered.

In several cases of unresolved pneumonia he has had promising results. He used the *x*-ray in these cases because he believed that it would probably act chiefly through increasing the velocity of some ferment processes, and because in unresolved pneumonia it is probable that the ferment processes that should and ordinarily do dissolve the exudate are ineffectual. In three such cases the clinical effect was a rapid clearing up of most or all of the signs, and in two of these cases in which Dr. Pemberton and he studied the metabolism they observed a tremendous influence that was coincident with the improvement in the physical signs, the metabolic alterations having been of much the same quality and degree as those that are seen at the time of an ordinary successful crisis. These latter results are, then, encouraging. While the others mentioned are not so, the author believes that there is certainly constructive work to be done in searching out the therapeutic relations of the *x*-ray, and not simply

the more destructive type of work that he has chiefly discussed earlier. This is particularly true if the work be planned with a view that this agent has a lively influence on metabolic processes, particularly on those that occur in the spleen, the lymphatic tissues, and the bone-marrow, and if it be carried out with a calm but definite appreciation of the restrictions that should be placed on any such experiments in therapeutics.

INTESTINAL ANTISEPSIS.

In the issue of the *St. Louis Medical Review* of August 18 a note from the *Boston Medical and Surgical Journal* was published, on the "Fallacy of Intestinal Disinfectants," in which the writer argued on theoretical grounds against the possibility of intestinal antisepsis. On the other hand, history presents us with innumerable examples of things that have been theoretically demonstrated by apparently unimpeachable logic to be impossible, which practical research has nevertheless shown to be facts, and concerning which wider knowledge has subsequently disclosed the fallacy in the hitherto seemingly unanswerable objections. Meanwhile, it is certain that many do believe in the practicability of attaining intestinal antisepsis, and it is significant that such are chiefly to be found among those who have given it a thorough trial.

In the *Georgia Practician* for July, Dr. John Forrest, of Charleston, S. C., admitting that perfect antisepsis is unattainable, even on the outside surface, let alone in the interior of the body, argues that nevertheless "such an approximation is attainable as will change the whole complexion of a case and bring about most satisfactory results from very unpromising beginnings." "Is not perfect health," he asks, "a condition of normal antisepsis? And what higher degree of antisepsis do we require to satisfy us? And yet such a condition is quite compatible with the presence of a countless multitude of microörganisms, some of which we know may even be pathogenic."

We cannot understand why it should be deemed necessary, as many of the opponents of intestinal antisepsis (though not the writer in the *Boston Medical and Surgical Journal,* apparently) seem from their arguments to assume it to be, to kill or injure the microörganisms in order to produce an effective stage of antisepsis. As Dr. Forrest points out, in a state of (as nearly as attainable) perfect health the microörganisms are still there in full force, but the physiological processes of the body are capable of taking care of them, so that the analytical and synthetical consequences of their life processes are rendered innocuous to their host. When human resistance becomes lessened, then the microörganisms "get in their work" as toxic agents; but till then the soil is not suitable. As King Chambers said, so far back as 1861, in a clinical lecture on "Typh-Fever," "But remember there are two things necessary to poisoning: not only the poison, but a person apt to be poisoned." Now, when we find a person whose resistance is so reduced that the microörganisms are able "to get in their work," is it really so very inconceivable that even minute quantities of certain antiseptics, such as may be safely ingested, should be sufficient to alter the dynamic status of the environment in which the microörganisms subsist, enough to render them temporarily impotent for harm? Meantime the human organism is gradually recovering its own powers of defense, sufficient to enable it to keep a conquered people, so to speak, vastly outnumbering the conquerer, in control, as history has shown repeatedly to be the case with regard to various bodies politic.

The human body is not a test-tube. The test-tube is practically inert, and so far as we can see has no part or lot, other than that of a container, in the processes at work in a chemical reaction or a bacteriological culture experiment; the human organism, on the other hand, has a most vital and potent influence. Moreover, one cannot poison the test-tube with either chemical or physiological poisons.—*St. Louis Medical Review,* Nov. 7, 1906.

THE CURE OF PSORIASIS.

In the *Journal of the American Medical Association* of November 17, 1906, BULKLEY reports his results in treating 500 cases of psoriasis. He thinks that as in the case of gout and chronic bronchitis, the psoriatic subject must recognize the existence of a disease of deep-seated nature, which will require the best efforts of the physician and patient, over a long period of time, in order to have it effectually overcome. The author commonly fixes two years (it may be longer) as the least period to be considered at first; and then if after that the patient relapses into exactly the same mode of life and condition of system as previously, there may be a threatening of the eruption. But if, with its slightest recurrence, energetic measures are at once taken and continued, the trouble may be avoided, as the author has observed time and again.

Time forbids going at length into the details of constitutional treatment, so different are the cases, but a few words of suggestion may be given. Mention has already been made of the excellent results sometimes obtained by antisyphilitic treatment, even when no specific history can be obtained, also of the disappearance of the eruption under the free use of nitric acid internally. In full-blooded, plethoric cases, tartar emetic in increasing doses, to toleration, given six times daily, with nux vomica and quassia, has cleared up a number of the author's cases in a surprising manner, without local treatment; but this needs to be followed by a tonic course of iron and arsenic, and perhaps returned to again. In cases in which debility was evident, a strong course of iron and arsenic, with bitter tonics, has had like effect, and the same has been accomplished with cod-liver oil, in suitable cases. There are also many patients in whom arsenic alone, in efficient doses, suffices to keep the disease in abeyance.

Arsenic is so well known that little need be said concerning it. The author has never had occasion to regret its use in suitable cases, and has had patients who consumed large quantities with only beneficial results. The greatest consumer of arsenic was a clergyman, under the author's care more or less for twenty years, beginning at thirty years of age, when he had already had the eruption eight years. He calculated that sometimes he took almost 8 ounces of pure Fowler's solution in the course of a single year, over half a gallon, in drops, in the course of fourteen years. But arsenic does not suit every case nor every stage of the disease. As is well known, it sometimes stimulates the eruption to increased activity, and is seldom of value in its acute or developing stage, but rather aggravates it.

Alkalies, properly used, and such remedies as promote a perfect urinary secretion, are of the utmost value in most cases of psoriasis; and it is here that the value lies in most of the mineral waters used at the springs or at home. But to be really effective they should be administered with a repeated and perfect knowledge of the kidney secretion, as shown by quantitative analysis. The urine should not be kept alkaline, but somewhat below the normal acidity. Acetate of potassium, combined with nux vomica, and the fluid extracts of dulcamara and rumex, are most valuable, especially in the congestive forms of the eruption.

Diet, undoubtedly, has much to do with psoriasis, and should always be most carefully attended to. Alcohol in any form, even the lightest wine or beer, is prejudicial and must be absolutely avoided. Whatever may be the mode of operation, there is no question in the mind of the author, from repeated observations, extending over many years, that meat, especially if freely indulged in, increases the liability to and severity of the eruption, as he reported ten years ago; and he is now more convinced in regard to this than at that time. For many years he has placed numerous psoriatic patients on a strictly vegetarian diet, with most excellent results; and these results are further corroborated by the fact that now and again, when one has broken through the regulations, he or she has reported with a recurrence of the eruption. He makes the diet absolutely vegetarian, not even allowing eggs or fish, or milk as

a beverage with eating, and sometimes he has even excluded coffee and tea with advantage. Excess of sweets also tends to increase the eruption in psoriasis, and these should be greatly restricted; moreover, as the eruption is often increased by dyspepsia, he sees to it that pastry or articles exciting indigestion are also avoided.

Hygiene has a certain bearing on psoriasis, and in an effort to secure a cure of the disease it should always be controlled. This cannot be gone into fully here, but if, as he believes, faulty metabolism is the bottom cause of the malady, every item which can conduce to its perfect performance should be attended to; and unless the physician investigates and directs this, the patient will be apt to live just as before. The author has also elsewhere reported psoriasis profoundly affected by the condition of the nervous system, the eruption appearing with each nervous breakdown, and we all know of the recurrence of psoriasis in connection with lactation. Temperature has much to do with the eruption, as it frequently disappears on removal to a warm climate, and the disease is relatively seldom seen in the tropics.

In regard to local treatment the author has little to say, except that he agrees with the most radical localists in regard to the importance (although not relative importance) and effect of local therapeutic measures; no one who has seen much of the disease could rightly do otherwise. The rapid removal of a long-standing and rebellious eruption of psoriasis by the proper use of chrysarobin, of good quality, is certainly a striking evidence of therapeutic power; but we all know the objections to chrysarobin, and often it is not feasible to employ it in private cases in an efficient manner. Sometimes, however, the eruption does not yield to it, and occasionally it fails owing to an inferior quality of the drug.

The author does not take the time to enter into the details of other local treatment, which are well given in literature, almost every variety of which he has, at one time or another, used in private or public practice. As in all other cutaneous maladies the application has to be fitted to the case, and varies according to the character and stage of the eruption, but time forbids consideration of the subject. However, he does say a few words in regard to the treatment of the eruption by the *x*-rays, in which he has had some interesting experiences. They are by no means suitable to every case, although as yet he has had no unfavorable experiences, except one, among a considerable number of cases thus treated, in part. In this patient, a man aged fifty-five, there was a slight burn on the abdomen, with the same strength of application used elsewhere; but this healed soon, and the results elsewhere had been so favorable that he insisted on having the *x*-ray still employed on other patches, even while this was sore. He has used it only on older, more chronic lesions, and has repeatedly seen a single application of medium intensity remove a patch entirely. It often leaves a brownish stain, which persists some little time. He has had cases in which, although new eruptions developed elsewhere, the portions which had been treated by the *x*-rays remained free. As an adjunct to the local treatment of psoriasis, in proper cases, he considers this new measure a most valuable addition to our armamentarium.

THE TREATMENT OF WATER GAS, CARBURETTED WATER GAS, AND CARBON MONOXIDE POISONING.

At the end of an exhaustive consideration of this subject in the *Lancet* of December 15, 1906, GLAISTER asserts that whether the kind of gas be "producer gas," water gas, carburetted water gas, or ordinary coal gas, the problem to be solved in the treatment of those deeply comatose from inhalation of the gas is how to overcome the association of the carbon monoxide with the hemoglobin and to restore the oxygen-carrying function of the red corpuscles. It will be obvious that the only difference in action of these gases is one of time, due to the difference in percentage of carbon monoxide which they respectively contain; or, in other words, because of the much less percentage amount

of carbon monoxide in coal gas it takes a longer time to produce an equal degree of saturation than in the case of the others. Even in coal-gas inhalation, however, when the person is found to be deeply unconscious, and particularly when ordinary remedial efforts prove unavailing, it is the toxic effects of the carbon monoxide which have to be combated. The first indication in treatment is to remove the sufferer, under suitable precautions, into the open air. By reason of the action of carbon monoxide on the vasomotor nerves producing coldness of the surface of the body these suitable precautions ought to consist of measures calculated to restore surface warmth, which is of considerable importance. Artificial respiration will only be necessary if voluntary breathing be embarrassed or irregular. Inhalations of oxygen should be given. If in spite of these measures no sign of recovery appears, bleeding and injections of saline solution or transfusion of live human blood should be carried out.

Yarrow, in a paper read before the Philadelphia Pathological Society in November, 1899, stated that he found experimentally on dogs that transfusion gave good results, the transfused blood being obtained from the carotid artery of a healthy dog and allowed to pass into the jugular vein, while saline solutions were only of temporary value, and hydrogen peroxide injected intravenously and subcutaneously yielded no beneficial effect. In carbon monoxide poisoning removal into the open air is not so urgently called for, although plenty of fresh air is necessary. The difficulty is to obtain dissociation of the gas from the hemoglobin even by the administration of oxygen, because of the diminished capability of the red corpuscles to absorb and carry oxygen. While artificial respiration, oxygen inhalations, and measures for the restoration of body heat ought to be persevered in until, at least, the animal heat is restored, should no further improvement be manifested, bleeding and transfusion should be resorted to.

THE TRYPSIN TREATMENT OF CANCER.

The reports which have appeared recently in the *Medical Record* on the result of the injection of pancreatic ferments in the treatment of cancer are exceedingly interesting, even if not conclusive. They are certainly of such a nature as to demand further essays of the remedy, though the lessons of the past should not be forgotten, and while trypsin is still on its trial it will be salutary to remember that there have been other remedies which seemed to promise well at first, but which are now, figuratively speaking, collecting dust on the top shelves of the pharmacies, out of sight and out of mind. The weak points in the case of trypsin, so far as it has been presented, are three: the small number of cases, the short time that has elapsed since the reported cures have taken place, and the lack of anatomical confirmation in most instances of the diagnosis of malignancy.

In some of the cases the diagnosis was established by a microscopical examination, and in others, such as the interesting laryngeal case reported by Dr. Rice, the clinical evidence of malignancy would have been accepted as conclusive had the disease run its usual course. But clinical evidence is insufficient in dealing with what is, according to all past experience, so improbable a fact as the absolute cure of cancer. Even a microscopical diagnosis in isolated cases would be brushed aside by the skeptical, if not by the judicial, as possibly erroneous, and the objectors will not be silenced until this diagnosis has been made a number of times by a number of competent microscopists.

The diagnosis being accepted, the number of cases in which the growth has disappeared after the use of trypsin, and the other pancreatic preparations, must be many times what they now are before the medical world will admit that a cure for malignant disease has been discovered. The instances of spontaneous cure of cancer are not few, and the disease has been seen to disappear under many and various forms of treatment. Violet leaves, condurango, thyroid

extract, and even soap have been reported as effective in a number of cases, and it is possible they may have given the fillip needed by nature to enable her to work a cure. Trypsin may act in the same way, or it may be endowed with a specific curative action. The cases thus far reported are too few to warrant a definite opinion.

Time alone can determine the actuality of the reported cures. Recurrence is the rule in all cancer therapy, whether by the knife, the *x*-ray, Coley's fluid, or other remedies, and few, even among those who are convinced that the cases treated were malignant and that the growths have disappeared under trypsin injections, will maintain that there is no possibility of recurrence. Yet that is what we should expect if the theory of Professor Beard, upon which the present experiments are based, is true. It is his belief that if the left-over asexual cells, which are the cancer cells, are once destroyed by trypsin, any further cancerous growth is impossible. The theory, with all its corollaries, is entitled to respectful consideration in view of the reports, meager though they still are, of apparently successful results, but time alone will prove it.

It may be noted, though the fact is not of much weight, that the reports of the results of the trypsin treatment in England have thus far been uniformly unfavorable. The remedy has been tried at the Cancer Hospital, the Middlesex Hospital, and other institutions in London without success, and Mr. Edmund Owen, in a recent lecture on cancer, asserts that there is no known method of treatment of cancer "which can honestly and confidently promise a cure." In explanation of this failure it is contended that the pancreatic extract used was inert, and that it was not administered properly. We have seen no detailed reports of these experiments and so are not in position to judge of their value, but if the trial of this method of treatment in America should eventually prove its worth, it would not be the first instance of a prophet finding honor in a country other than his own. The results of the trypsin treatment of cancer in this country are not yet sufficient to carry conviction, and further trials may result in another disappointment and lead to the abandonment of the method, but we believe such trials are fully justified by the apparent success already obtained.—*Medical Record,* Dec. 22, 1906.

THE THERAPEUTIC VALUE OF COMPLETE VOCAL REST DURING THE SANATORIUM TREATMENT OF LARYNGEAL TUBERCULOSIS.

Sir Felix Simon in the *British Medical Journal* of December 8, 1906, contributes a paper with this title. He believes that complete vocal rest is particularly indicated in cases of inflammatory irritation of the larynx in pulmonary tuberculosis, especially in obstinate catarrh of the larynx, congestion of the vocal cords, relaxation of the ventricular bands, and—in more advanced cases—in circumscribed ulceration of the vocal cords, ulceration in the interarytenoid fold, general infiltration, and in impeded movements of the cricoarytenoid articulation. But we cannot expect anything of it in those hopeless cases of the last stage in which the whole larynx has become a prey to deep ulceration and partial perichondritis, and we also cannot conceal the fact that in a number of cases in which one had from former experience been entitled to hope that it would prove useful the result is disappointing.

Nor can it be denied that even during the stay at the sanatorium the method is very irksome for the patient. Seeing that anyhow—especially at the commencement—the stay at a sanatorium acts rather depressingly upon many patients, this state of matters is further increased by the curtailment of intercourse with other patients, which is inseparable from the employment of the method. Even strong-minded patients have said that they had needed their whole reserve of energy in order to strictly preserve complete silence for a long time. Much depends in this connection upon the temperament of the patients; much also upon the question whether by chance they are together with reasonable or with unreason-

able patients in the sanatorium. Concerning this point, however, diametrically opposed statements have been made. Whilst one patient stated that she had been supported and most sympathetically encouraged by her companions in distress in preserving complete silence for many months, another very energetic patient, whose severe laryngeal tuberculosis has now for years been arrested by means of the silence method combined with local treatment, stated that nothing had rendered his undertaking so difficult as the unreasonableness of other patients in the sanatorium, who had time after time endeavored to tempt him to talk. It is here that the task of the physician to the sanatorium begins. If he will take the trouble to help his patient to successfully go through his difficult ordeal by means of suitable arrangement of the patient's daily life, by prescribing solitary walks, by suitably placing the patient who is to be silent between two other reasonable patients at the common meals, and by instructing the other patients accordingly, he will be able to do very much to lighten the disagreeableness of the method.

One must be prepared for the question whether the results of such religiously-maintained and long-continued silence are worth the difficulties and unpleasantness of the method emphasized. In reply to this question the author is able to state that in quite a number of cases in which it was employed, either alone or combined with suitable local treatment, the results were such as in former times he had hardly ever observed. Obstinate inflammatory irritation, which had defied every local treatment, disappeared; infiltration, if not too much developed, receded; isolated ulcers on the vocal cords, the ventricular bands, and in the interarytenoid fold lastingly healed; and even motor disturbances in the cricoarytenoid articulation improved, or in a few particularly favorable cases entirely gave way to a return to normal conditions.

He is further able to state that the cure or improvement in quite a number of these cases has remained a lasting one, as he has been able to convince himself by examination a long time after the end of the treatment. Surely these are pleasing results. On the other hand, as already stated, he has not entirely escaped disappointment. In the majority of his cases, however, in which the method was strictly enough and long enough persevered with, the results have been distinctly encouraging.

The author, however, wishes particularly to warn against being too easily discouraged by apparent want of success at the commencement of the treatment or by occasional slight relapses. Perseverance is never more required than during the silence-cure of laryngeal tuberculosis.

THE TREATMENT OF LA GRIPPE.

NAMMACK states in the *Medical Record* of December 22, 1906, that in a case of la grippe the patient should be at once put to bed, for although prophylaxis against the attack is theoretical and to a great extent impracticable, prophylaxis against sequels is in the highest degree practical and useful. Those who continue at work and endure exposure not infrequently suffer at a later period of the disease from the most serious results. A fair-sized, single dose of calomel, followed if necessary by a saline draught, will help to eliminate some of the infection, if given at the time of the initial chill. The patient's bed should be warmed, and he should receive, in the bed, a foot-bath of hot mustard water with rubbing of the extremities, and a hot drink. Alcohol will be useful in those accustomed to its use, also in the aged and in the weak. Young, healthy, abstemious patients will not need it at this stage. The diet should be restricted to milk, albumen-water, gruel, and the ordinary fever foods. The use of milk should not be pushed in those who have a heavily coated tongue, for it will only cause indigestion. Concentrated meat broths can be used, unless active diarrhea, or the condition of the kidneys, should be a contra-indication. Acidulated drinks will relieve the thirst in some, and also soothe the stomach and flush the kidneys. Others will be benefited by alkaline fluids, such as

Vichy water, or by bland waters. Cold baths and cold compresses are generally not well borne, and increase the discomfort.

The average patient will expect to swallow drugs, and the atrocious pains sometimes present will suggest the use of analgesic antipyretics. It is the conviction of the author that drugs of this class contributed more to the death-rate during 1889-1890 than did Pfeiffer's bacillus. At the present time their use is not so general, but they still occupy too prominent a place in the lay mind. Pain which is severe enough to require drugging will be better managed by Dover's powder or codeine. Another drug largely used by self-prescribers in this affection is quinine. There is not the slightest evidence that quinine in any dose favorably modifies the course of the attack, or shortens its duration, although it may be useful during convalescence. The rule that "the physician is to be a watchman all the time and a therapeutist only when occasion arises" applies with striking force to influenza, yet the symptoms of this affection cry aloud for relief, and of these symptoms the depression and the respiratory catarrh will in most cases be prominent. It is the author's method usually to meet these symptomatic indications by a prescription containing five grains of ammonium carbonate, five grains of ammonium salicylate, and half an ounce of the aromatic wine of erythroxylon coca (of the National Formulary) in each dose. This may seem like active therapy, but this combination has done him yeoman service during many years in private practice, and in dispensary and hospital services. It will relieve headache and neuralgia and stimulate the heart, respiration, and kidneys. Incidentally, the author remarks that it is sometimes fearfully and wonderfully made by apothecaries who are pressed for time. When this combination fails to meet the indications mentioned, the case is serious enough to require constant attention, and the hypodermic use of strychnine, caffeine, or camphor.

The stage of convalescence must be carefully managed by tonic and supporting treatment, especially addressed to the nervous system, in order to avoid the formidable array of complications and sequels, any of which may develop even in mild cases.

The most common complication is bronchitis. This will require its usual treatment, with the important reservation that no remedy should be employed which is a sedative to the nervous or circulatory system. This reservation excludes antimony, aconite, veratrum viride, potassium salts, and large doses of ipecac, and compels us to fall back upon steam inhalations, hot drinks, counter-irritation, rest in bed, and codeine for excessive cough. Should bronchopneumonia develop, strychnine and aromatic spirits of ammonia, well diluted with water, are indicated. Oxygen inhalations, though much derided, are advantageous in some cases. The presence of profuse bronchial secretion in the smaller tubes positively contraindicates morphine.

The poison of influenza is capable of setting up serious changes in the intracardiac ganglia and in the myocardium; therefore the pulse and the heart sounds must be carefully studied, and all unnecessary movements on the part of the patient absolutely prohibited until the rhythm and force of the heart have been restored. The three tinctures, nux vomica, belladonna, and digitalis, act well in bringing about this result, or a similar combination of strophanthus, cactus grandiflorus, and belladonna sometimes acts efficiently. The coexistence of valvular disease of the heart will add its own specific indication for treatment.

Kidney impairment will also supply a field for therapeutic intervention, which is too wide to be gone over within the limits of this paper. Symptoms referable to the nervous system may dominate the clinical picture from the onset, or may become prominent at any time during its course. It is no uncommon sequel to see robust, self-reliant men converted into feeble, hypochondriacal valetudinarians by an attack of grippe, which has weakened the general nervous mechanism, as well as the special nervous apparatus of the heart. This sequence of events seems especially liable

to happen to scholars and brain workers, who should receive the benefit of a long period of rest with entire change of scene and employment before taking up again their life-work.

A CLINICAL STUDY OF 210 CASES OF ACUTE ARTICULAR RHEUMATISM.

PHILLIPS in the *Cleveland Medical Journal* for December, 1906, gives the following treatment for acute articular rheumatism:

The patient, clothed in a flannel night-gown, should be kept at rest in a comfortable bed and should lie preferably between blankets. Abundant drinking of water is necessary to favor elimination and to make up for the fluid lost through free perspiration. Instead of plain water, cream of tartar water may be substituted. The bowels should be opened freely by the administration of calomel followed by a saline, and afterward kept moving regularly by cascara. Where the perspiration is free, the patient can be made comfortable by sponging his body with water to which sodium bicarbonate has been added. The diet at first should consist of milk, although if the latter is not well borne there is no objection to giving soups, animal broths, rice, or tapioca.

Because of the great tendency to anemia, the patient should be placed on a liberal diet as soon as the temperature is normal.

Much has been claimed for the alkaline treatment of rheumatism, that it shortens the course, and that it prevents the development of endocarditis by depressing the circulation. Though the alkalies may be useful adjuncts to treatment, no drugs give such marked beneficial results as the salicylates; indeed, we have come to look upon them as a specific for this disease. The best form is the sodium salicylate from the true oil of wintergreen itself, but aspirin or salicin may be tried. The hospital routine is to give 20 grains of the sodium salicylate every hour until the patient is toxic, the total amount not to exceed 200 grains. If the patient is then not toxic and the disease has not yielded to treatment, he continues giving the salicylate, watching closely the effect of each dose, until in some cases as much as 300 grains have been taken. There is less likelihood of disturbance of the stomach if the salicylates are given well diluted, and in combination with sodium bicarbonate. It is gratifying indeed to see the remarkable transformation in the patient. Patients admitted in the afternoon with a temperature of 103° and joints so painful that they scream with pain if the bed is touched, next morning have a normal temperature and move their joints freely, the pain, tenderness, and swelling having all disappeared. Often cases which have been treated outside the hospital with small doses of salicylates without benefit, have rapidly cleared up when the drug was pushed to its toxic limit. Seldom is the stomach disturbed. The toxic symptoms noted are ringing in the ears and deafness.

Local treatment of the joints is of secondary importance, though it is very comforting in the acute stage. Oil of wintergreen should be painted on the joints, and they should be wrapped in thick cotton wadding. Great relief is sometimes given by the application of hot stupes of lead and opium, or by the application of menthol and oil of wintergreen ointment.

After the acute symptoms have subsided the local applications are discontinued, and 15 to 20 grains of sodium salicylate is given three times a day. To ward off anemia, iron should be prescribed early. The patient should be kept in the recumbent posture for three weeks to avoid cardiac complications. This is especially difficult with the salicylate treatment, as the patient feels so well in two or three days that he often demands to be allowed up.

In acute endocarditis and pericarditis an ice-bag should be applied to the chest. The damage to the valves in the former complication may be lessened by prolonged rest in bed and by the use of small doses of potassium iodide in the late stage. If the effusion in pericarditis becomes large, paracentesis is indicated. The use of blis-

ters over the sternum hastens the absorption of the effusion.

In children, especially, subsequent attacks may be prevented by giving sodium salicylate in small doses for one week out of each month, continuing this for at least a year. If the child has endocarditis with enlarged heart, a prolonged stay of at least six months in bed is advisable. Plenty of fresh air is needed, and the patient should be kept amused with his toys and books, care being taken to avoid excitement. One year ago a child six years old was admitted to the hospital suffering from rheumatism, with chorea, subcutaneous fibroid nodules, and an enlarged heart, the left border of which reached nearly to the anterior axillary line. He was kept in bed six months and treated as outlined above. At the end of that time the chorea was well, the subcutaneous fibroid nodules had disappeared, and the left border of his heart was just outside of the mammary line.

NEWER IDEAS OF THE TREATMENT OF BRIGHT'S DISEASE.

In the *Cleveland Medical Journal* for December, 1906, CROFTAN says that the treatment of Bright's disease must concern itself with counteracting, so far as that is possible, the formation of various groups of toxic bodies. This can be done by paying strict attention to the diet and by promoting intestinal antisepsis by various means, the details of which cannot be discussed in this brief abstract. The best remedies for the latter purpose the author has found to be the bile acid salts and the sulphocarbolate of zinc. That intestinal putrefaction is being held in check can be determined by the reduction or disappearance of the aromatic sulphates (with indican as their chief representative) from the urine, also by the disappearance of the conjugate glycuronates and the compound glycocolls. Bismuth subnitrate when given by mouth, together with intestinal antiseptics, moreover, should not color the stools black if intestinal putrefaction is being held in check.

The treatment of the small group of cases of Bright's disease that is not due to intestinal derangement but to metabolic perversions of an obscure type, usually occurring in young subjects, is much more difficult because nothing very tangible, in the obscurity of our present knowledge, presents itself for treatment.

In this group of cases one is limited in one's endeavors to purely symptomatic treatment. The latter, however, does not consist in the treatment of the renal complications alone, but more generally in the treatment of the cardiovascular signs; and to be successful in the treatment of Bright's disease the renal idea should be largely relegated to the background and attention bestowed upon keeping down the blood-pressure and regulating the action of the heart. A case of Bright's disease should, broadly speaking, be treated as a heart case and not as a kidney case; for most sufferers from this disease die not from the nephritis but from failure of the heart and from the complications that are engendered thereby, and that differ in no material respect from the secondary signs seen in any case of failing cardiac compensation.

The measures at our disposal for regulating the blood-pressure are dietetic, hydrotherapeutic, and medicinal. The diet should be selected in such a way that no preformed pressor principles are ingested, and the minimum of food is eaten that leads to the formation of such bodies; chief among these articles are nuclein-containing foods and foods containing extractives, for the latter incorporate the purin bodies and the former lead to the formation of these purin bodies in process of intracellular dissimilation. Alcoholic beverages of all kinds should be eschewed. Tea and coffee and cocoa are also bad. Smoking is always detrimental.

Hydrotherapeutic measures are of signal value, especially the simple warm bath every evening. The details of these measures cannot be described within the narrow frame of this abstract.

Of medicines the best of all are the nitrites and preparations of nitroglycerin.

They are rarely needed, however, if sensible hydrotherapy is instituted; and it is best to keep medicines in reserve for emergencies in this as in any other chronic disorder. The use of very small doses of digitalis—*i.e.*, of one or two drops of a good tincture throughout the course of the disorder, or at least for many months at a time—is of great value, inasmuch as the drug given in this way seems to regulate the heart's action, and to protect it, one might imagine, from the abnormal stimulating effect of circulating toxins. The administration of such small doses even for long periods of time, in the experience of the author, does not deprive the heart of a vigorous digitalis stimulation should it become necessary to use large doses in emergencies later on.

THE TREATMENT OF CHRONIC VALVULAR DISEASE IN CHILDREN.

The *Brooklyn Medical Journal* for December, 1906, contains an article by CORNWALL on this subject. He states that the use of heart stimulant drugs is often a vital part of the treatment of chronic valvular disease in children, but in order to get the best results they should be administered with care and judgment. Some of them are so very effective that it is easy to fall into routinism in their use, giving them in every case of valvular disease in which compensation is lost or weakened, and in more or less the same doses, and rapidly increasing the doses if the desired effect is not speedily obtained. Such injudicious drugging is frequently responsible for failure to produce good results. In giving these drugs to children the following considerations should be borne in mind:

First, they should not be given at all if the recumbent position alone is sufficient to restore the circulatory balance. It is only when compensation is so far lost that the recumbent posture alone will not restore it that they are indicated. If continued after compensation has been gained they may do harm.

Second, they should not be given to restore compensation without at the same time keeping the child absolutely in bed. Although it is true that adults, under certain circumstances, may be given heart stimulants to bring their circulation up to the level while they are allowed to be on their feet, such treatment is never justifiable in the case of children.

Third, they should be given in doses suited as nearly as possible to the capacity of the heart muscle. Because a certain dose of a heart stimulant fails to bring about the desired effect promptly, it does not follow that a larger dose will produce it. Often it happens that a larger dose will produce an injurious instead of a beneficial effect. If the heart is greatly dilated and its muscle correspondingly feeble, large doses of stimulants exhaust it. In bad cases it sometimes pays to try the effect of diminishing the doses of heart stimulants instead of increasing them. The author reports such action followed by good results. In order to get the greatest benefit from the use of heart stimulants when the heart is much dilated, small doses should be given at first, such as the weakened muscle is able to respond to. Later, when the muscle has gained in strength, larger and more effective doses may be given. In bad cases we should be satisfied at first if we can keep the patient's condition from getting worse. If it does not get worse it is probably getting better. In advanced cases of dilatation with much dropsy, visceral congestion, etc., improvement may be very slow. But if we have patience, and do not try to hurry too fast the development of the compensatory hypertrophy, we sometimes get surprising recoveries. If on the other hand we get impatient, and pour in heart stimulants in a frenzied attempt to make the heart do what is beyond its power, we may hasten the child's death.

The particular heart stimulants which should be used in a given case must be determined by the physician according to his experience, but there are a few guiding indications, such as the degree of heart

failure, the extent of dilatation, and the character of the lesion. When there is considerable dilatation digitalis is the classical remedy, but the superiority of this drug over all others in the treatment of dilatation is less striking in the case of children than in the case of adults. The author has found strophanthus as effective or more so in a large proportion of cases. In cases of severity he usually gives both drugs alternately, and has the mother, or nurse, report to him on the condition of the child while taking each. The report more often than not has been that the patient seemed better while taking the strophanthus. Even in mitral incompetency, where digitalis is generally supposed to be preëminently indicated, he has seen strophanthus produce equally good results. In bad cases of dilatation from any cause strophanthus sometimes acts better than digitalis. In the treatment of the various stenoses he thinks there can be little question of its superiority over digitalis. Possibly the explanation why the action of strophanthus is sometimes better than that of digitalis lies in the fact that it exhausts the heart muscle less than does the latter drug. But strophanthus, with all its good qualities, cannot entirely replace digitalis as an agent for the steady training of the heart muscle. In the use of these drugs much depends on the method of administration as well as the reliability of the preparations.

Besides digitalis and strophanthus there is only one other heart stimulant which we are likely to need in the treatment of most cases of lost compensation. This is strychnine. Strychnine can be used in connection with the other two drugs oftentimes with great benefit, and it can be continued after they have been stopped, and even after compensation has been restored, because it does not have the bad effect on the compensated heart that they are apt to have. It is a valuable adjuvant heart stimulant, but cannot be relied on by itself to restore compensation.

Besides the three heart stimulants above mentioned, there are many others which are in good use, but with the exception of aromatic spirits of ammonia and morphine they need not be mentioned here. The others are inferior, and the only excuse we could have for using them would be that we could not get the better ones. The desire to use something different would not be a sufficient excuse. Aromatic spirits of ammonia is valuable as an emergency stimulant, and morphine is sometimes a life-saving drug. When the dyspnea and cough are extreme and the patient is utterly unable to sleep, morphine or codeine is imperatively called for. But it should be remembered that children usually make more fuss with a given amount of discomfort than adults.

SOME OBSERVATIONS ON PYREXIA AND SUBNORMAL TEMPERATURES IN INFANCY AND CHILDHOOD.

NORTHRIDGE writes under this heading in the *Brooklyn Medical Journal* for December, 1906, and gives the following advice:

If the cause of a fever can be ascertained, and that cause be a removable one, it is a pleasant duty to treat the fever.

Thus castor oil and calomel, quinine, and the salicylates do yeoman service where indicated. Aconite and digitalis are also sheet-anchors. Diuretics, diaphoretics, and laxatives are all very useful where indicated. In the experience of the author it is never necessary and would be often dangerous to use the coal-tar products to reduce the temperature in the fevers of infancy. The author merely mentions them to condemn them.

Fever calls for active treatment for the reduction of the temperature when the elevation causes certain symptoms, or when it is so very high that the swift production of such symptoms may be anticipated. These symptoms are principally drowsiness, delirium, convulsions, rapid and weak heart action, restlessness, and sleeplessness.

Per contra, if the child is calm, smiling, and restful, too active interference is unnecessary.

Hyperpyrexia should always be combated, as the body rapidly wastes when it is present.

As to food, nothing need be said save to remark that it is the author's belief that food very often acts injuriously, increasing the fever when given in a solid form, or in an improper form, or in too great quantities, in fever cases. Witness the favorable drop in the temperature often following the use of a laxative, with complete withdrawal of food for a few hours. Fever consumes tissues to be sure; but the repair process must be gone about very carefully and slowly, or we will but burden the exhausted organism and thus increase the fever and exhaustion.

While perspiration is slight, as a rule, in children, the skin is apt to be full of blood and to feel dry and hot. Pungent is the word that best expresses the sensation given on touching such a skin. In some cases the skin is pale. A bath with friction will send the blood into the skin. The friction is as important as the bath.

The cold friction bath is our best measure for the relief of fever in the cases in which it is dangerous because of its height and persistence. Properly given, the temperature in almost every case in which it is used will drop, commonly from two to three degrees and sometimes more, and the patient will fall asleep. Baruch gives the technique as follows: A suitable tub is filled three-quarters full of water at a temperature of 95°. Give the baby ten minims of whisky. Strip off the clothes and place it in the water with its head resting on the left arm of the nurse, while with her right hand she makes gentle but persistent friction all over the child's body. The water is reduced to 85° by adding cold water or ice to the bath.

The duration of the bath should be five minutes for a weak and ten minutes for a strong child. The baby should then be removed from the bath and wrapped up well in a sheet and blanket, and a hot-water bottle put to its feet. Generally the child will lose all nervous symptoms, the face will assume a placid, restful expression, and a quiet sleep follows.

"Prolonged shivering after the bath means that either the bath was too long or the temperature was too low."

"Cyanosis of the face demands cessation of the bath."

"Chattering of the teeth demands cessation of the bath."

Crying should not be heeded.

The reduction of temperature by irrigation is in many cases very effective, and should always be tried faithfully before the cold bath is used.

Positive instructions should always be given that the lower end of the irrigating bag be not placed higher than 1½ feet above the anal opening. The water should be used at a temperature of 95°, and should be encouraged to gush out alongside of the tube whenever the rectum fills by pressing the tube gently to one side.

In this way about a gallon should be used.

Sometimes irrigation given most carefully fails to make any great impression upon the temperature. It is then well to repeat the procedure within three hours. If this does not bring the temperature down materially, irrigation should be abandoned in that particular case and other measures resorted to.

The alcohol and water sponge bath is very efficient in some cases, being all they need. It should always be tried before using the cold bath. It is always grateful to the patient, never frightens, and will quite often reduce the temperature to within safe limits. Like irrigation it is of much more value in some cases than in others as a febrifuge.

CLIMATE IN THE TREATMENT OF TUBERCULOSIS.

The importance of correct appreciation of the problems involved in the advice given patients concerning change of climate for tuberculosis is forcibly set forth by M. A. Rogers, a physician with eleven years' experience in the desert (Arizona) in the

treatment of large numbers of tuberculous patients. He objects to the current statement that climatic treatment is not a necessary, and hardly an important, factor in the cure of tuberculosis, and he regards a stay in an arid climate as of especial importance for those convalescing from acute diseases, at which time they are exceptionally liable to contract tuberculosis. Students who have had an attack of pneumonia, pleurisy, or measles can pursue their studies in the University of Arizona when they might succumb to tuberculosis if they remained at home. Nursing women and debilitated persons generally will benefit greatly by such a change. The climate of Arizona is especially favorable, he states, to the growth and development of children, infant mortality among those of American parentage being almost *nil*.

In reference to the treatment of tuberculosis the statement is made that only patients in the incipient stage recover, although patients in advanced stages may prolong life beyond what would be possible in more favorable localities. The consumptive in an arid climate needs medical care, rest, and nursing as much or more than at home. Treatment in a sanatorium is most favorable, and Rogers emphasizes the importance of the immigrant at least being supplied with money enough to make himself comfortable without work. The proper time to send patients should be considered. To send them to Gallup, in New Mexico, at an altitude of over 6000 feet above the sea, in the dead of winter, when there is probably a foot or two of snow on the ground and the temperature 10° below zero, and to tell them to live out-of-doors, is to invite a fatal termination. What kills them a little quicker, according to Rogers, is to send them to Tucson or Phœnix in June, when the thermometer is registering 110° or 115°, or even higher, in the shade, with instructions to "get a tent and go out in the desert and rough it." He states that the three great advantages of the arid climate are: (1) The dry, invigorating. sterile quality, which acts as a tonic. (2) The fact that the open-air treatment can be carried on without interruption during the entire winter and with comfort to the patient. (3) The almost continuous bright sunshine, which, besides being curative, is conducive to cheerfulness and hopefulness. All forms of tuberculous throat affections, Rogers states, are unsuitable for climatic treatment. He makes a plea for the establishment of a large sanatorium with ample endowment to care for the unfortunate patients who go to Arizona with insufficient means to care for themselves properly.—*Journal of the American Medical Association,* Dec. 15, 1906.

THE TREATMENT OF CHRONIC CONSTIPATION.

The *British Medical Journal* of December 1, 1906, contains an article on this subject by SIBLEY, in which he expresses the belief that the active treatment of constipation may be divided into two classes —external and internal:

I. The external, or what is now called physical, therapeutics is of great importance if permanent good is to be obtained. This treatment should be directed to muscular exercise, both active and passive. The former should be encouraged by way of all forms of bodily movements, especially as in cycling, rowing, and climbing (mountaineering), but also in walking, and all active outdoor games and sports.

If desirable, certain definite movements of the trunk and limbs may be prescribed, with or without the addition of resistance. The latter, or passive exercise, should be by way of massage, possibly general, but especially local to the walls of the abdomen. Abdominal massage should be firmly performed for manipulation of the superficial abdominal muscles and subcutaneous tissues, but very lightly performed over and in the direction of the natural peristalsis of the large intestine—commencing in the right inguinal region upward to the hepatic flexure, then across the transverse colon to the splenic flexure, and downward along

the descending colon to the left inguinal region. A most important point to be remembered in connection with this subject is that in most cases of old-standing constipation the position of the various parts of the colon is entirely changed, and parts, especially of the ascending and transverse colon, may be much out of the normal regions. Massage of the abdomen should always be very carefully performed, and chiefly with the object of improving the condition of the abdominal muscles, rather than for any direct mechanical effect upon the contents of the bowels. In no case should massage or kneading be prescribed with the idea of breaking up fecal accumulation, as in this way grave injury might be done.

In addition to manual massage, great help may be obtained by the use of the vibrator, especially if worked by electricity, as this can be so finely adjusted to meet the individual case. So also "succussion" may in some selected cases be practiced.

Combined with the various forms of massage, electricity in its numerous modern applications is most useful, not only in producing peristalsis during its application, but especially in its after tonic effect on the muscular walls of the intestines, in addition to those of the abdominal parietes.

The aim of the electrical treatment should be threefold: To improve the tone of the innervation to the intestinal walls, to restore tone to the involuntary muscle fiber of the gut, and to strengthen the external abdominal muscles.

The ordinary constant current applied to the different regions of the abdominal wall for a few minutes daily has long been recognized as of great value. To get the full benefit from this in certain selected cases it is desirable to insert one pole into the rectum. More recently the high-frequency currents have become popular, on account of their general tonic effect, in addition to their local action.

II. Internal treatment may be subdivided into three divisions—diet, drugs, and enemata.

A. Diet should be considered the most important, and no case can be satisfactorily treated unless the condition of constipation is considerably improved, if not cured, by the supervision of the foodstuffs. Patients must avoid (1) bodies containing astringents in any form, such as tannin, found in most teas as generally infused, and also in red wines, especially Burgundy; (2) bodies which are deficient in cellulose, such as potatoes, rice, sago, tapioca; (3) milk; and (4) last, but not least, hard water—that is, water containing lime salts; this should be avoided not only for drinking, but also for all cooking purposes.

On the other hand, these patients should consume plenty of bodies containing abundance of (1) cellulose, such as cabbage, spinach, asparagus, carrots, onions, leeks, garlic, rye, oats, and bran, either in bread or biscuits; (2) those containing sugars and aperient salines, such as apples (raw or baked), rhubarb, prunes, figs, treacle (the old-fashioned black molasses), honey, and orange marmalade; (3) some bodies which stimulate the hepatic secretions, as salads; and (4) bodies rich in fats—butter, fat meats, etc.

The quantity of liquids taken should also be regulated. Many subjects troubled with constipation do not take nearly enough fluids in the course of the twenty-four hours, and an extra pint or two of plain water, with a lump of sugar if agreeable, hot or cold according to season of the year or individual taste, should be given, especially as far as possible on an empty stomach, the last thing at night or the first thing in the morning, or both night and morning.

B. Drugs. At the commencement of systematic treatment some medicines are important to make a good start, especially in getting rid of any old-standing accumulation, but the object should be to diminish and in time do away with these altogether as a routine treatment.

In deciding on the question of drugs, the following different therapeutic actions must be taken into consideration, which for practical convenience may be divided as follows:

1. Laxative: such as aloin, aloes, cascara, rhubarb, senna, castor oil.

2. *(a)* Secretion stimulants: salines, such as natural aperient waters (Apenta, Condal, Hunyadi, Rubinat), chloride of ammonium, sulphate of soda, and sulphate of magnesium. *(b)* Hepatic stimulants: aloes, sulphate of soda, colocynth, jalap, rhubarb, podophyllin, ipecacuanha. *(c)* Cholagogue: calomel, blue pill, gray powder.

3. Peristalsis excitants: strychnine and nux vomica.

4. Spasm relievers: belladonna, bromides, valerian, and asafetida.

5. Nerve tonics: zinc valerianate, arsenic, silver nitrate, glycophosphate of soda.

As to a choice in the multitude of drugs, old and new, probably many of the old-fashioned, such as calomel, rhubarb, magnesia, and senna, in various combinations are the most valuable, or rather, perhaps, are the least deleterious; but it is not every patient who will nowadays take a medicine which is not palatable or convenient, and so we have to resort to various tricks of the pharmaceutical trade to obtain the desired result. It is always very important not to allow patients to take the same form of aperient medicine for too long a period, and generally desirable to let them have more than one variety to be taken on alternate days. At the time of prescribing an aperient medicine or pill, it is necessary to add to it some drug which will have a tonic effect on the walls of the digestive apparatus, in addition to the simple aperient action. Valuable drugs of this nature are belladonna or strychnine, which in combination with aloin or extract of aloes, calomel, or cascara, not omitting a little resin as a valuable adjunct, will make a reliable pill. After a time the dose of the aperient drug should be decreased and the quantity of the tonic one increased. A very successful method in many cases of chronic constipation, especially in anemic subjects, both young and old, is to prescribe a pill containing the dried sulphate of iron, with aloin, and possibly at first a small quantity of extract of aloes, two or three times a day after food. In the course of a few days the quantity of iron should be increased and of the aloes decreased, until a pill containing iron alone is found to be sufficient, and this should be continued for a long period, modified from time to time, according to circumstances. It is often better to commence by giving a milder aperient pill night and morning rather than a stronger one at night only, and from time to time to order a saline, or one of the natural aperient waters, to be taken the first thing in the morning. Saline waters in some instances will be sufficient by themselves, but in very obstinate cases they often only produce discomfort with watery evacuations, leaving large quantities of solid material behind. Of the natural aperient waters, those with a preponderance of salts of the sulphate of soda over magnesia are probably the best to prescribe in most cases, as being less irritating to the mucous membrane.

C. Enemata. Great assistance, especially in removing recent or even old-standing accumulations in the large intestine, can be obtained by the judicious administration of an enema. In some cases injection of warm water and soap-suds acts well; if necessary, the addition of olive or castor oil or turpentine will greatly assist the result.

It is, especially in old-standing cases of constipation with accumulations, most important that the enemata be given with the patient in the knee-elbow position, or if on the back with the buttocks well elevated on pillows, and the foot of the bed raised on blocks. In some cases it may be desirable to shift the position of the patient to one side or the other, according to the part of the bowel it is necessary to get the fluid to flow into by gravitation. By carefully regulating the position and elevation of the patient, it is often possible to inject large quantities of water high up as far as the cecum. In some cases a long, soft tube may be found advantageous over a short one, but this requires considerable skill in passing up satisfactorily.

The temperature of the fluid injected

should be as nearly as possible the same temperature as the body if we wish it to be retained for any time, and should be injected by a continuous stream from a suspended irrigator, and not in an interrupted one forced in by a bell-pump syringe.

If cases of old-standing, hard, dry, fecal accumulation are being dealt with, much assistance will be obtained by injecting a few ounces of olive oil, and leaving this in for some hours before the bowel is washed out; by this means the hard, dry masses will be softened.

If it is only necessary to excite the rectum, injection of a drachm or two of glycerin or the insertion of a glycerin suppository is very efficacious.

In most cases after giving aperient remedies by the mouth for a few days, and having excited the upper region of the digestive apparatus into more vigorous action, an occasional simple enema greatly assists the treatment in the earlier stages.

In many cases of simple constipation the injection of a drachm or two of olive oil into the rectum at bedtime will produce a satisfactory evacuation the following morning.

THE TREATMENT OF BRONCHIECTASIS.

The Practitioner for December, 1906, contains an article by CHAPLIN on this topic. He says the treatment resolves itself into preventing the undue accumulation of sputa in the lifeless and non-resilient tubes, or if that be impossible of accomplishment, into rendering the contents of the bronchi aseptic. To empty the cavities three methods are usually employed: (1) The method of posture; (2) the agency of drugs; (3) the help of surgery.

Posture.—Ewart has laid great stress on this form of treatment, and has formulated in detail the method of carrying it out. There can be no doubt that bronchiectatic patients derive great benefit from it, and in all cases it should be put in practice. The main points in the method may be briefly summarized. The foot of the bed should be raised on blocks six inches high, and not more than one pillow should be allowed. The patient should be encouraged to lean over the side of the bed in the morning, and while in that position make an attempt to expel the contents of the tubes. In children, the plan of lifting them up by the feet, and somewhat roughly percussing the back, is often productive of good results. Respiratory exercises of a forced nature should also be practiced.

Drugs.—Emetics have found a place in the attempts to empty the tubes, but it is evident that this method cannot be constantly employed. Stimulating expectorants are generally given, but it must be confessed that they exert but little influence upon the case.

In the past cases of bronchiectasis frequently came into the hands of the surgeon, but the experience of such operations for opening the cavities and draining them has shown conclusively that but little good, and often much harm, has attended the practice. Now that it is generally recognized that, in the majority of cases, the dilatations are multiple, but few operations are performed. The surgeon rarely has difficulty in opening a bronchial dilatation and draining it, but of what value is that when, in all probability, many others remain unopened? In a series of cases quoted, more than one died as the result of operation performed, when no grave symptoms were pressing.

Surgical operation has little or no effect upon the fetor, and there are dangers to be encountered during its performance, such as hemorrhages and septic infection of the pleural cavity, which should give pause before lightly undertaking the project. Indeed, it may be asserted that cases in which the bronchiectases are multiple—*i.e.*, the chronic form—should never be operated on, however bad the condition may be. In the more acute type the conditions are somewhat different, and so long as the disease, as shown by physical examination, is limited the operation may be

tried in suitable cases, since here, as a matter of experience, the bronchiectasis is often single, or if double, is at least localized.

Methods of Rendering the Contents of the Cavities Aseptic.—To this end drugs have been administered by way of mouth, but with no appreciable result. There is, however, one exception in the treatment of the fetor by garlic, as advocated by the late Dr. Poore. By this method the fetor can be certainly changed, but it is doubtful if the contents of the cavities are rendered aseptic for any length of time. Inhalations of thymol, eucalyptus, and other similar essential oils are also prescribed, but with no lasting benefit.

Intratracheal injections, advocated by Grainger Stewart, have been employed, and with very good results. The only objection to their use is the manual dexterity required in the operation. The fetor can certainly be removed, but one may reasonably ask if the lowest bronchiectases can be reached by this method, and if the small quantity introduced is sufficient to render aseptic the whole of the bronchial tract.

The Inhalation of Creosote Vapor.—Eleven years ago the writer advocated the use of the vapor of the commercial coal-tar creosote in the treatment of bronchiectasis. He was led to try this method on account of its being brought to his notice that a patient in the hospital, suffering from the complaint, had expressed his intention to try to obtain work again at some large creosote works, since he had felt much better when working there some time previously. A visit was paid to the works in question, and some of the creosote obtained. Several patients were placed under the treatment, and after the details were worked out the excellent results from the use of this method were soon manifested. Patients who had been in despair, after trying all manner of remedies, rapidly improved. Since then this treatment has been extensively used by the writer and other physicians, and the result has been to establish it as one which is perfectly safe, and one which offers considerable prospects of success. In using this method it must be remembered that it is of the utmost importance to carry it out in detail, and to persevere with it until the patient has become accustomed to the somewhat trying conditions. Too often it has been abandoned before it had a fair chance of doing good.

But the fact remains that in the large majority of cases in which the creosote inhalations have been fairly tried benefit has resulted, beyond that accruing from other methods, and frequently lasting good has taken place, and in a few cases permanent cure of the fetor. In undertaking this treatment the natural objection of the patient to submit to a method which is irritating must be gradually overcome. Until the patient has had a daily sitting, lasting for from half an hour to one hour, for a week or two, improvement to any extent must not be expected.

As the success of this method depends so much on the details, the main points will be given. The room should be small, about seven or eight feet square, and it should be made as air-tight as possible, so as to prevent the undue escape of the vapor. There should, however, be sufficient ventilation to allow some fresh air to gain access to the room. In the center of this room, on a raised stand, a fairly deep enamel dish on a tripod should be placed, and under the dish a spirit lamp with a regulating mechanism. Into the dish about five or six ounces of common commercial coal-tar creosote is poured. Before the patient enters the chamber the spirit lamp should be lighted, and the creosote vapor driven off, until the room is fairly thick with the fumes. Until the patient is accustomed to the fumes the room need not be densely filled with the vapor. If the lamp is regulated there is little fear of the creosote either boiling over or catching fire. The patient's eyes should be protected with a pair of watch-glasses rimmed with a piece of ordinary sticking plaster, and the nostrils should be plugged with pieces of cotton-wool. The sitting at first should last about twenty minutes a day, and be gradually increased until an hour is taken, and the

room is so dense with fumes that it is difficult to distinguish objects. For those who are nervous it is a good plan for the attendant to take the first few sittings in the patient's company, or a pane of glass may be let into the door, so that the patient feels confidence when he sees that the nurse is close at hand and watching. The sittings should be continued for six weeks or three months; after that a biweekly sitting should take place. Such is the method, which at first sight appears to be a drastic and nauseating proceeding, but the writer has never met with a case unable to take the treatment, out of an experience of over a hundred cases.

RESECTION OF THE CECUM WITHOUT PRELIMINARY FALSE ANUS.

Most surgeons perform colostomy before any operations on the colon, but BAKES (*Archiv für klinische Chirurgie,* lxxx, 4) claims that in certain cases it is unnecessary.

If the patient is in bad condition, or if the heart is weak, it is best to do a colostomy; also when it is necessary to operate during an acute attack of pain, or when the colon is found to be very adherent to the surrounding parts. In other cases, even when there is marked obstruction, the resection may be performed at once. Anesthesia should be as light as possible, and the author operates largely under local anesthesia. After resection the ends are closed blind and united laterally. Minute details of the method of anesthesia are given.

PEPTIC ULCER OF JEJUNUM FOLLOWING GASTROENTEROSTOMY FOR PERFORATING GASTRIC ULCER.

LYLE (*New York Medical Journal,* Dec. 22, 1906) notes that the first case of peptic ulcer of the jejunum was reported in 1899 by H. Braun. This followed gastroenterostomy for pyloric stricture. The affection is very apt to affect males in middle and old age. The time elapsing between the first operation and the formation of an ulcer in the jejunum varied between ten days and eight years. In the majority of cases the interval was from two to six months. Clinically the cases can be divided into three groups. In the first there are no premonitory symptoms or very indefinite ones, the patient being suddenly seized with violent abdominal pains and other signs of perforative peritonitis. There were eight cases of this type in the thirty-one cases reported, six ending fatally. In the second form after varying intervals of freedom from pain the patient begins to have symptoms similar to those of previous stomach ulceration. Pains of variable intensity which come on at mealtime or two or three hours after it are generally noted in the stomach area, radiating from the left border of the ribs downward toward the navel. In some cases food aggravates these pains and in others relieves them. In the region of the upper half of the left rectus there can often be made out a painful infiltration of the abdominal wall, sometimes a well-defined tumor. Twenty of the cases belonged to this class. The third form described by Gosset is characterized by the fact that the ulcer adheres to and opens into some other portion of the digestive tract, usually the transverse colon. The history of these cases is that after a lapse of time the patient again shows ulcerous symptoms, and communication is established with the colon. Then appear the typical symptoms of diarrhea, rapid emaciation, and fecal vomiting.

In the first form the diagnosis is practically impossible and the prognosis bad. The treatment consists in prompt operation.

In the second form the physician remembers that the patient has had a gastroenterostomy done, and if the return of stomach symptoms has taken place should think of the possibility of the jejunal ulcer and watch the stools for blood. In the third form the only treatment is operative. In general the causes predisposing to ulcer formation of the stomach and duodenum are the potent factors in the production of a similar lesion of the jejunum. The most important factor is undoubtedly hyperacidity. It is interesting to note that no cases of jejunal ulcer have been reported following gastroenterostomies for carcinoma. The situation of the ulcer at the site of the gastroenterostomy or near it

also points toward increased acidity as the factor, the gastric juice being undiminished in its acidity at this point. An underlying factor is the disturbance of circulation probably brought about by the operation itself or by the abnormal position of the loops forming anastomosis.

Ulcers of the jejunum in their microscopical and macroscopical appearance are identical with those of the stomach and duodenum. They begin as small hemorrhages in the mucous membrane, from which develops a hemorrhagic necrosis. Thorough digestion of this necrotic tissue and loss of substance takes place, which at first affects only the mucous membrane, but later works into the deeper tissues and finally involves all the layers of the intestinal wall. The ulcer is itself round and often has a punched-out appearance. This is common in cases running an acute course. In slower cases the loss of substance in the mucous membrane is greater than in the deeper layers. There is likely to be peripheral inflammatory infiltrate.

The case reported by Lyle was that of a well-developed man twenty-six years old, who had no stomach trouble until after an attack of measles in 1898. He began to suffer from gnawing pains in the abdomen coming on three or four hours after eating, generally in the morning or afternoon, seldom in the evening, and never at night. This pain would last until solid food was taken. The more of this ingested the greater the comfort of the patient. This condition continued without treatment until November, 1904, when he suffered from an attack of influenza. A month later he noted that the pain was not relieved by food, and was sufficiently severe to oblige him to stop work and consult a doctor. With some intermissions of pain he remained in about the same condition until April 5, when an hour and a half after dinner he was seized with violent abdominal pains and vomiting coming on without previous exertion or warning. Diagnosis of appendicitis was made, and he was operated upon about twelve hours after the beginning of his attack. A perforated round ulcer of about the size of a ten-cent piece was found within three-quarters of an inch of the pylorus, but no dilatation of the stomach. After suturing this posterior gastroenterostomy was performed, uniting the most pendulous portion of the stomach posteriorly to the jejunum about five inches below the ligament of Treitz, after which an enteroenterostomy was performed about four inches below the gastroenterostomy. The patient progressed favorably for thirteen hours, when he had a severe hemorrhage. He was infused and was given adrenalin by the mouth. Thereafter recovery was uninterrupted until three weeks later, when he was seized with abdominal pain, with vomiting, which was relieved by washing out the stomach. Improvement throughout was steady and progressive until six months after operation, when there was return of abdominal pain and vomiting, following which the patient noticed black stools, but did not mention the symptom to his physician. His old symptoms then returned, together with repeated tarry stools and recurrent vomiting. Examination of stomach contents demonstrated persistent hyperchlorhydria. This patient was put to bed on an ulcer cure for six weeks.

THE EARLY RECOGNITION OF CANCER OF THE RECTUM AND ITS TREATMENT.

DREW (*Clinical Journal*, Dec. 5, 1906) deplores the fact that cancer of the rectum fails to reach the hands of the surgeon until the classical symptoms of the well-developed and usually incurable disease are present. This he attributes to the fact that cancer of the rectum in its early stages gives rise to practically no pain. Though there may be even in the beginning some slight bleeding with a little tenesmus and distress, these symptoms are customarily attributed to piles. Drew holds that the rectum should always be examined when symptoms develop, and believes that the most thorough medium for this end is the finger, since in the majority of cases the cancer begins within easy reach. For higher lesions he advises the proctoscope, but admits that

such infiltrations are not likely to be discovered until they are well advanced. Even when the bowel is fixed by peripheral infiltration he holds that attempts at removal are not necessarily futile. Before embarking upon any radical operation he considers it necessary to search carefully in order to exclude the presence of secondary deposits, otherwise the patient may be submitted to an extensive surgical procedure which would be quite useless.

These secondary deposits, he states, are particularly common in the pelvic peritoneum. Their presence can only be excluded by performing exploratory laparotomy. This he makes a routine procedure, placing his incision obliquely in the left inguinal region so that it can be utilized for a left inguinal colotomy.

INDUCED LABOR AS A CONSERVATIVE OPERATION FOR CONTRACTED PELVIS.

MORSE (*American Journal of Obstetrics and Diseases of Women and Children*, December, 1906) for the purpose of his paper divides all labors into three general classes: cases in which the natural powers are sufficient; cases in which forceps or version are needed to supplement the natural powers; and cases in which some one of the cutting operations on mother or child is necessary, in which premature labor is induced to avoid the same.

Enumerating the usual methods of treatment for the last series of cases in the order in which they are most frequently attempted, forceps, version, Cæsarian section, symphyseotomy, and craniotomy comprise the list of available operations from which we must choose the one most suitable and applicable in a given case. Forceps and version are the methods most frequently selected by the average practitioner, his ability to apply forceps and do version being the sheet-anchor of treatment in all difficult labors. Disaster, however, follows when great skill and better judgment would have dictated a better plan of action. Symphyseotomy having been tried, has been laid aside as not beneficial. Craniotomy should rarely be performed excepting in case of a dead child. This leaves Cæsarian section as our method of procedure. To-day, following our most advanced ideas and with the best surroundings, the mortality is conservatively estimated at 10 per cent, though Zweifel reports 76 cases and one death, and Reynolds 76 cases and one death. To the dweller in cities, where the best surgical skill is at command, with modern hospitals and nursing, Cæsarian section may be set down as a safe, sound, and legitimate obstetrical operation. These conditions are not within the reach of most women, and to them Cæsarian section means a last, desperate chance. Hence it appears that in those cases in which the natural powers are insufficient owing to disproportion between the size of the child and the birth canal, there remains but one course of action open to the obstetrician when it is desired to deliver a living child—*i.e.*, the induction of labor at such period of viability as will give the child the best chance of living. There are few physicians who could not to-day induce labor in a thoroughly aseptic manner, incurring the least possible risk to the mother. Moreover, modern science has evolved a very thorough system of care for the premature infant.

The induction of labor in case of pelvic contraction, when the object sought is the delivery of a living child, involves a knowledge of the period of gestation, a knowledge of the size, shape, and character of the pelvis, and a knowledge of the size of the fetal head, especially its size relative to that of the pelvic brim. Accepting 280 days as the normal limit of the date of pregnancy, 220 days has been set as the earliest possible time from which a child can survive. The old rule of counting back three months to the date of the last menstruation and adding thereto seven days is probably the best means of determining the date of expected delivery, though quickening, when felt, should not be neglected. Important information may be gotten by the examination of the abdomen, the height of the uterus at various periods of pregnancy, by ascertaining especially the relation of the fundus of

the uterus to the umbilicus. The fact must not be overlooked, however, that in a deformed pelvis there is a tendency toward a condition of pendulous abdomen and likewise a height of the fundus more than usual at the same period of gestation in the normal pelvis.

So long as we can be sure of the viability of the fetus we are warranted in inducing labor whenever we are convinced that further delay would be dangerous. The best pelvimeter, Morse holds, is the hand. By it all the information needed in these cases can be acquired, though such an examination made in nervous women requires an anesthetic. By the same method the size of the child's head may be ascertained. The head, or presenting part, must be engaged in the brim of the pelvis. Therefore a constantly enlarging head must be watched, and by pushing it down into the brim the relation which one bears to the other must be estimated. This should be done regularly and at frequent intervals, the rule being that so soon as any difficulty is experienced in forcing the head down into the cavity no time is to be lost in inducing labor. It may be necessary to use an anesthetic for purposes of determining this point. Morse bases his method of procedure on the fact that the fetal head may be compressed without injury 0.4 inch. If the conjugate is 3½ inches, then labor should be induced between eight and one-quarter to eight and one-half months, primiparæ being allowed to wait until a week before term. When the conjugate is 3.35 inches labor should be induced at from eight to eight and one-half months; if the conjugate is 3.12 inches, labor is to be induced between eight and eight and one-quarter months; if conjugate is 2.95 inches, induce labor at seven and one-half or eight months; when conjugate is 2.75 inches, seven months and three weeks; 2½ to 2.36 inches, at seven months. Below 2.36 inches conjugate, the indication for premature labor does not exist. These rules are for flat or generally contracted pelves.

Morse also states that so far as his own observation extends the best method of inducing labor is by introducing a bougie between the bag of waters and the uterine wall. Labor is not set up quickly. Repeated efforts are required to inaugurate expulsive pains. If not of sufficient force to accomplish the desired end forceps may be employed as soon as sufficient dilatation of the os permits.

The Paris Maternity reports 30 per cent of six-months' infants saved. Statistics show a saving of 63.6 at seven months, and 85.7 at eight months. Morse holds that the results from premature delivery will show a minimum mortality for the mother, and for her child a better chance of life than labor at full term or any one of the emergency operations resorted to when there is a failure of the natural powers.

OZENA—TREATMENT BY NASAL TAMPONADE.

SONDERMANN (*Münchener medicinische Wochenschrift*, December, 1906) considers the first step in the successful treatment of ozena lies in the complete removal of the foul crusts, which not only produce pressure atrophy, but prevent healing medicaments from reaching the mucous surfaces. When these crusts are sprayed or picked away, even at the expense of time and pains, they very quickly form again; indeed, in twenty-four hours they are found to have reached their original size and thickness. Since it is impossible for most patients to consult a physician daily for thorough cleansing it is advisable that some means should be devised by which they may accomplish this end themselves. Irrigation is the method commonly employed. It often fails because of the firm seating of the crusts; moreover, it is not unlikely to cause middle-ear trouble. Sondermann has devised a simple method of accomplishing an apparently thorough cleansing. A condom tied about a tube is passed into the nostril and blown up by the patient himself. When the lower turbinal is atrophied this rubber bag becomes closely applied to the atrophied walls of the nasal passages, projecting backward into the nasal

pharynx. After full inflation the tube is pinched tight and the rubber bag is left in place for five or ten minutes; the air is then allowed to escape and the bag is withdrawn. This has the effect of thoroughly loosening all the crusts, which can be blown out without trouble. The application is repeated twice daily for the first week, after that once daily. By perseverance and frequent repetitions of this treatment Sondermann believes that these cases can be not only greatly relieved but even cured.

BLOODY METHOD OF RAPID DILATATION.

HOLMES (*Surgery, Gynecology, and Obstetrics,* December, 1906) concludes an article on this subject as follows:

Vaginal Cæsarian section is almost indispensable in certain cases of true cervical rigidity. In the absence of complications, expectancy, aided by hysterauxesis, should be precursors of the major operation.

In the presence of grave contributory complications, as eclampsia, heart disease, etc., complicated by cervical rigidity, the operation is indicated.

We do not know when so-called operable carcinomas of the cervix have metastatic involvement of adjacent glands. If the carcinoma, limited to the infravaginal cervix, has glandular metastases, then the radical vaginal Cæsarian section is only a temporizing measure; at a period not remote, removal of the glands is indicated, after the technique of Ries and Wertheim. Evident encroachment of the cancer into contiguous tissues should be held a contraindication to the radical vaginal procedure.

Rarely will vaginal Cæsarian section be the operation of election in fibroids blocking the pelvis in labor. The abdominal route probably will continue to be the method of choice.

Eclampsia, *per se,* is not an indication for vaginal Cæsarian section. If the cervix is uneffaced, or if it is rigid, then the operation becomes a clinical necessity. Thus far the results, in general, have not been any better by this new procedure than by means of the manual method or Bossi dilators.

Vaginal Cæsarian section is an irrational procedure in placenta previa, and nearly so in ablatio placentæ. A placenta previa with the placental site on the posterior wall, with a rigid os, in the absence of hemorrhage, might be an indication for vaginal Cæsarian section.

The most approved technique includes anterior and posterior incisions, version, immediate removal of the placenta, repair, with tamponade if necessary. Vaginal Cæsarian section demands hospital facilities, if it is to be done rightly.

The dangers of the operation are real, and comprise injuries to the bladder, tearing of the uterus, and hemorrhage both from the incision and from uterine atony. Probably time will prove that dystocia in subsequent labors is directly due to cicatricial contractions of the scar, or that rupture of the uterus is a sequential accident.

PRESENT VIEWS ON DISEASES OF THE JOINTS.

MARSH (*British Medical Journal,* Dec. 8, 1906), after calling attention to the fact that the first step toward a proper understanding of the large majority of diseases of the joints is the regarding of synovial membranes as parts of the vascular connective tissue, devotes himself particularly to a consideration of that group of joint affections in which serious oversights and mistakes are made mainly because though the infection is produced by such every-day agents as the streptococcus, staphylococcus, and gonococcus, their symptoms differ so widely with those which we are in the habit of associating with these several infections that the connection is apt to remain undetected. He holds that gonococcal arthritis when it occurs secondary to a long-lasting case of gleet may come on in precisely the insidious, slowly progressive way characteristic of tuberculous infection. He calls attention to the fact that joint trouble may originate from a septic process in any part of the body, particularly noting the close connection existing between acute rheumatism and septic conditions of the fauces. He reports a case in which a man suffering

from what is called acute rheumatism of the knee, characterized by synovial effusion, great pain and infiltration of the surrounding structure, together with heat, tenderness, and pitting, very promptly recovered by the clearing out of two suppurating tooth roots, although the joint remained stiff with adherent patella.

Marsh notes that he has seen two cases in which carious teeth were cut down level with the gum and a new crown was applied, in which the patients became subject to what was regarded as acute osteoarthritis involving several of the large joints, and those also of the hands. On removal of necrosed fangs and the evacuation of a small amount of pus from the sockets the joint affection was arrested.

Marsh reports a third case of apparent typical rapidly progressing gonorrheal arthritis completely and promptly cured by the removal of a carious tooth root. Reference is made to cases of septic arthritis in cases with septic cavities in the lungs; lesions of the skin, catarrhal inflammation of the genito-urinary tract, particularly after parturition, are quoted by Marsh, who states that when this infective arthritis occurs it takes the form of plastic inflammation attended by the development of adhesions leading to a varying degree of fibrous ankylosis. The synovial effusion is mostly limited, amounting to not more than three or four ounces, and is often absent. Synovial tissue and the periarticular tissues are infiltrated, considerably thickened, firm, inelastic, and brawny, so that the joint is enlarged from uniform swelling. When the knee is affected, thickening may extend to the periosteum and adjacent structures, investing the lower end of the femur, and the bone may feel enlarged for four or five inches above the condyles. The skin covering the joint, in severe cases, is dusky-red, or may be unaltered. Pain may be severe or slight. Muscular fixation and atrophy are usually marked. Suppuration practically never occurs, although the local and general symptoms sometimes simulate it. Firm and complete fibrous ankylosis is the result to be expected in acute cases.

In treatment every effort should be made to find out the source of infection. It should be remembered that a very limited amount of septic material may produce infection which should be treated. The other sources of infection, such as the intestinal canal, must be suspected, and corrective measures adopted. After the source of infection has been taken care of treatment will have for its end the removal of the coagulable lymph, separation of adhesions, restoration of movement, and the repair of atrophied muscles. These ends are best attained by hot douching, massage, and manipulation under an anesthetic. Douching should be employed morning and evening at the highest temperature that can be borne without discomfort. When the joint is cool and painless manipulation should be the first step. If it is evident under an anesthetic that the joint is so fixed that it will not yield to considerable force, hope of restoring movement must be abandoned. Though it may be possible to tear the cicatrix across and so produce movement at the time, a cicatrix will invariably reform, probably over a wider area than before, and stiffness will return; the damage done will be followed by a period of much suffering lasting several weeks, and by thickening and brawny swelling extending over many months.

These adhesions may, however, be broken if no ankylosis occurs in a faulty position, though excision, particularly in the knee-joint, is usually a better operation. When the adhesions readily give way under manipulation, the manipulation should be repeated about once every two weeks.

TECHNIQUE OF LOCAL ANESTHESIA IN RECTAL SURGERY.

TUTTLE (quoted in *Boston Medical and Surgical Journal*, Dec. 20, 1906) has employed this technique in upward of four hundred cases. The lesser sphincterian nerve of Morestin and the inferior hemorhoidal nerve are reached by a single puncture of the hypodermic needle back of the anal commissure, and the introduction of 20

to 30 minims of one-half per cent eucaine or cocaine so that the sphincter can be thoroughly stretched. After this is done the hemorrhoids, or other conditions for the relief of which operation is proposed, are further anesthetized by the local injection of small quantities of 1/10-per-cent solution of eucaine, cocaine, or other anesthetic. Sometimes it is necessary in very sensitive patients to anesthetize the branch of the pudic nerve which supplies the sphincter at the anterior commissure by the introduction of a small quantity of solution at this point.

VACCINE THERAPY AND PASSIVE HYPEREMIA IN SURGERY.

HOLLISTER (*Surgery, Gynecology, and Obstetrics,* December, 1906) states that in order to secure the best results in general surgical work to-day one must combine (1) the most approved methods of surgical technique with (2) vaccine therapy, such as has been of late made practical by the work of A. E. Wright, of London, and (3) the working methods of hyperemia, as have been so strongly advocated by Bier, of Bonn, and many others. In other words, in order to do the most good in the shortest time for the patient, the general surgeon must use one, or a combination of two or all, of these different lines of treatment, depending upon the nature and stage of the affection.

Wright has developed to a definite practical working basis the use of "vaccines" for tubercular, staphylococcic, and streptococcic (and we shall probably soon be able to say gonococcic) infections. He has developed a clean-cut laboratory technique whereby one can in most cases not only diagnose the individual infection, but can accurately judge the effect on the patient of the vaccine given from dose to dose. By so doing he has been able to accomplish results of which we have all read and heard.

A favorable outlook has been earned in this opsonic work by experiments. The results reported by Bier and many others throughout Germany, especially at the surgical congress in Berlin last spring, from the use of active and passive hyperemia, especially in the so-called surgical infections, are good.

Hollister's results in a number of selected cases treated by passive hyperemia have been as a rule excellent.

With one exception the patients have considered themselves improving. In this one the general condition was critical in the extreme, because of a mixed infection when the inoculations were begun, as shown by the marked emaciation, decubitus, high temperature, discharging fistulæ, etc.

In no case has there occurred evidence of further advancement of the infection.

In one case a fistulous tract, open for months, closed for the first time, and remained closed for about three weeks to date.

In a case of arthrectomy for tuberculosis of the elbow-joint, with persistent fistulæ, rapid increase in power to use the right arm is noted.

The value and necessity of the vaccine therapy to the work of the general surgeon is assured, because:

1. We can diagnose the specific infection by observations of the opsonic index, and this without administration of any vaccine whatever.

2. We can raise and maintain this opsonic index to a point as high as or higher than that of the normal individual by the properly sized and properly interspaced doses of the specific vaccine.

3. When we do so raise and maintain it, we add to the resisting power of the patient's serum, and hence the tendency of the patient is toward recovery.

SPRAINS AND THEIR SIGNIFICANCE.

BENNETT (*British Medical Journal,* Dec. 8, 1906) observes that it is probable that neglect or indifferent treatment of some of the minor injuries results in more disability amongst the community generally than would arise from a considerable percentage of the cases which are thought to require operation. It has been conclusively shown

by the *x*-ray that a large proportion of injuries commonly called sprains are in reality complicated by slight fracture, the latter, however, being of subordinate importance in the pathological sense because the sprain of the soft parts is the predominant feature.

Bennett's classification of sprains is as follows:

1. Simple sprains involving the soft parts only.

2. Sprains with fracture, giving symptoms so slight as to make diagnosis under ordinary conditions impossible.

3. Finally, gross nerve injury.

The first essential in treatment is to determine whether fracture coexists. This can be determined only by the use of the *x*-ray. It should be an accepted practice that, when possible, every sprain, especially those near joints, should be examined in this way. On general principles when the *x*-ray cannot be procured it is safe to regard every sprain near the joint in which the symptoms are unduly exaggerated as being complicated by fracture, especially if the parts concerned be the phalanges or the metacarpal region. Crepitus is of little value in making the diagnosis of these fractures, since it is often absent when fracture is present, or may be present from involvement of the joint, even in the absence of fracture.

After deciding as to the presence of absence of fracture, the next point is to look for evidences of gross nerve lesion. The distal part should be examined for numbness, which may be due to nerve shock, in which case it disappears in a few hours. If, however, it persists for more than twelve hours a gross lesion of the nerve branch is fairly certain.

Simple sprains—*i.e.*, those not complicated by fracture or nerve lesions—may be classified as those with swelling and those without, the latter constituting a very small minority, practically limited to the sprains about joints amongst the deep muscles, as in the back and neck. In sprains without swelling the main and important indication is the relief of pain, which is often intense. Absolute rest with very firm compression is usually effectual in this respect. The best way of applying pressure is by strapping. The strapping should be applied with due consideration for its purpose—*i.e.*, firm support of the part and at least a partial splinting. Early massage is indicated in all these simple cases without swelling. Passive movements should follow later, at perhaps the end of a week. Voluntary movements on the part of the patient should be begun early and are often a source of relief. When this sprain is accompanied by immediate swelling, which, of course, must be due to blood effusion, cold is of no particular service and in debilitated persons may sometimes lead to extensive sloughing. This is particularly the case in patients suffering from advanced renal degeneration. Hot fomentations usually serve a better purpose and are safer. Pressure is also not thought of under such circumstances by Bennett, who simply employs absolute rest. When the immediate swelling has ceased to increase a firm bandage is applied to the part, followed by massage. This bandage is not of impermeable rubber. In case skilled massage cannot be procured strapping is the best alternative, the frequency of its renewal being determined by the diminution of the swelling. For the prevention of adhesions and muscle wasting the voluntary movements, massage, and passive movements are serviceable. Slight voluntary movements should be begun at once, the patient being instructed to many times a day attempt to move his joint as freely as possible without producing pain. Massage should not be delayed for more than twenty-four to thirty-six hours after the cessation of the increase of the local swelling. Passive movements should be delayed if immediately following them there is a marked increase in the heat and tension of the part.

When an interval has occurred between the infliction of the injury and the full development of swelling—*i.e.*, when the latter is due to an inflammatory effusion—treatment depends upon the absence or presence of heat, and in the case of joints

upon the amount of tension. In the absence of local heat free massage and manipulation are indicated, combined with firm elastic pressure. In effusion without heat, occurring in joints two weeks or more after the accident, the possibility of syphilis or gout as contributing factors must not be overlooked. Iodides in some form internally are often helpful, especially if combined with free inunction of petrolatum locally.

Free incision and cleaning out of the well-marked hematoma greatly hastens recovery from a sprain. Tension within the joint after sprain, which may come on either immediately or after some days, is always associated with local heat and also great pain. When absolute rest and hot fomentations fail to relieve the pain aspiration is indicated, enough of the fluid being drawn off to make the patient comfortable.

In the treatment of sprains with fractures massage as a rule should be commenced at once; rest for the part in splints must be maintained for a long enough period to enable the detached bone to reunite sufficiently to retain its position during voluntary movements. Early movements are essential to quick recovery; these must be passive and not voluntary as in simple sprain.

Sprains with gross nerve injury are most important because of the difficulty in treatment and their resulting in imperfect cure, though the defective recovery is not generally attributed to its real cause. Many of the imperfect results are due to indifferent diagnosis, the nerve lesion having escaped notice in consequence of its slight symptoms. When the evidence of nerve lesion is pain along the line of the distribution of the nerve rest only will bring about a complete and permanent cure. This must be continued until all symptoms of nerve pain have passed away. From this comes the difficulty in treatment, since the patients can rarely realize the importance of prolonged rest. Massage does harm in the early stages of this type of case, but later combined with electricity may be most serviceable.

In cases in which numbness is an indication of nerve lesion treatment is quite different, and if the symptoms have not disappeared in twenty-four hours the only hope of cure lies in skilful use of massage, supplemented after two or three days by galvanism, with flying blisters over the seat of the lesion.

The late consequences of sprain are classified as preventable and unavoidable in certain cases. Among the preventable late consequences are persistent pain, stiff joints, wasting of muscles, general relaxation of joints, and deformity. Under the unavoidable consequences of sprain are osteoarthritis, local paresis, and myositis ossificans. The persistent pain is held to be usually due to excessive immobilization in ordinary cases causing adhesions. Stiff joints are attributed to the prolonged use of splints or the delay in the commencement of voluntary and passive movements. Such stiffness can usually be avoided even when splints are required for a long time by the removal of the appliances for at least an hour a day, during which the patient is encouraged to move the part as much as the pain will allow. Passive movements are practiced depending upon the conditions. Excessive relaxation of the joint is occasionally noted, due to wasting of the muscles. This is remedied by early massage and active and passive movements. The late deformity of sprain is in the adult always the result of an undetected fracture. In growing people it may arise from injury to the epiphysis.

Osteoarthritis is very often traced to a joint injury which even though slight is followed by effusion. The author holds that excessive immobilization is responsible for the development of this condition.

THUMB REPLACED BY A GREAT TOE.

A man who had lost his right thumb while a child was treated by KRAUSE (*Presse Médicale,* No. 93, 1906) in a novel manner.

He first cut the skin of the stump and freed the dorsal tendons. Then cut the skin and tendons of the dorsal surface of

the great toe of the same side and resected the end of the metatarsal, so that the first phalanx could be applied to the end of the metacarpal of the thumb. The dorsal tendons and skin of the thumb were then sutured to those of the toe. A dressing was applied to hold them in position and was left seventeen days. The operation was then completed by section of the ligaments and palmar tendons and skin and the suture of the corresponding parts. The result was excellent and the new joint was freely movable, but further exercises will be required to make it strong enough to be useful.

HEART MASSAGE AS A MEANS OF RESTORATION IN CASES OF APPARENT SUDDEN DEATH.

GREEN (*Lancet*, Dec. 22, 1906) notes that massage of the heart as a practical means of treatment in cases of sudden failure of the pulse and respiration, especially when such an accident follows the induction of chloroform anesthesia, is based on Schiff's laboratory experience with dogs, he having been able to prove that if the thorax is opened and at the same time air is insufflated into the lungs, by rhythmical compression of the heart with the hand and continuous pressure of the abdominal aorta so as to bring the blood in greater quantity toward the head, it is possible to reëstablish the heart-beat even up to the period of eleven and a half minutes after the stoppage of that organ.

Tuffier and Hallion later communicated a similar series of experiments along with notes of a case in man. They were able to restore the heart-beat to animals which had been suspended for a varying time, from one to five minutes.

Prus in 1900 published the results of experiments performed by him on dogs; some dead from chloroform, some asphyxiated, and some electrocuted. Of the dogs which were chloroformed the heart stopped in times varying from fifty seconds to twenty minutes after the commencement of anesthesia. Heart massage and artificial respiration were started in periods varying from fifty-five seconds to one hour after the arrest of the heart. In sixteen cases—*i.e.*, 76 per cent—the results were successful, natural pulsation returning in periods varying from thirty seconds to twenty minutes. All the animals thus restored to life were killed at the end of the experiment save one, which was alive and well eight months later. In this particular case massage was commenced four minutes after arrest of the heart, and pulsation returned after massage had been persisted in for five minutes. Of the forty-four dogs which were asphyxiated, thirty-one recovered, but of the thirty-five which were killed by electricity only five were restored to life.

Batelli showed that in many of the unsuccessful cases massage caused fibrillary twitchings of the heart muscles instead of true contractions. Once these twitchings appear it is almost certain that failure will result. He was, however, successful in overcoming them by an alternating current of 240 volts. He later demonstrated that these fibrillary twitchings developed more frequently in animals that were experimented upon in a fasting state than in those which had had a few hours previously a feed of albuminoids and carbohydrates.

Kuliabko performed a remarkable series of experiments in which he used the hearts of rabbits killed for the purpose. He removed the hearts from the bodies and put them in an ice-chest for forty-four hours. At the end of this time he succeeded in restoring pulsation to them for several hours by injecting Locke's fluid into the coronary arteries. Later, in a similar manner he restored the hearts of rabbits that had died from disease, even three or four days after death; and in August, 1902, he succeeded twenty hours after death in restoring pulsation to the heart of a boy aged three months, who had died from double pneumonia, which pulsation continued for over an hour.

Velich successfully repeated Kuliabko's experiments, and stated that Spina injected into an artery in a direction toward the heart a large quantity of normal saline solu-

tion (200 Cc. in a dog) at from 35° to 40° C.; and by thus doing, along with the practice of artificial respiration, he revived animals in which the brain and cord had been destroyed, or which had been poisoned with alcohol, nicotine, etc., even when ten minutes had elapsed since the heart's action had been arrested.

Bourcart in a series of experiments in dogs used the subdiaphragmatic method for massaging the heart, and also had successful results.

D'Halluin in 1904 and 1905 noted as the result of his experiments that the longer the time which elapses between the stoppage of the heart and the beginning of the massage the greater is the probability of the fibrillary twitchings. For their treatment he finds that the intravenous injection of a solution of chloride of potassium (one-fifth of a grain for every kilogramme of the animal's weight) is the most useful, and considers that it acts first by arresting the heart and so stopping the twitching. Then if massage is immediately commenced the salt solution is distributed through the general mass of blood and dilutes its tonic properties.

After this review of the laboratory experimental evidence Green reports two of his own cases. The first is a case of chloroform death dependent on cardiac arrest. The respirations continued spasmodically for five minutes after all heart sounds had ceased. Twenty-five minutes after the heart had stopped the abdomen was quickly opened through an incision beginning about one inch below and to the left of the tip of the ensiform cartilage, and passing downward and outward along the left costal margin until it was large enough to admit the right hand. This was carried up toward the heart, the diaphragm only intervening between the two. The heart was motionless and flaccid. Rhythmical compression of the organ was begun with the right hand pressing, through the relaxed diaphragm, against its lower and posterior surface, and the left hand outside over the precordial region, the rate of compression being about 70 per minute. This method was continued for about two minutes without appreciable effect. The surgeon then grasped the apex of the heart without any difficulty with his right hand, his thumb being over the right ventricle and his fingers surrounding the left ventricle. Interrupted compressions were continued. There was soon noticed a slight fluttering of the organ, and at the same time the pupils contracted slightly. In a few seconds the heart began to beat forcibly with more than normal vigor at a rate of about 90 to 100 beats per minute. The artificial respirations were continued all the time. In a very short period after the restoration of the pulse spontaneous breathing reasserted itself, and the breathing became regular. The skin and lips resumed their normal appearance, and in twenty minutes from the beginning of the incision the heart and lungs were performing their functions normally. Sensibility, however, never returned. Toward the afternoon the patient developed tonic spasms with rigidity of the muscles of the limbs and trunk, and died twenty hours after the respiration and heart-beat had been reëstablished.

The second case died of syncope in consequence of diphtheria. Artificial respiration was begun at once, and fifteen minutes later the abdomen was opened and the heart was compressed as in the former case. Free passage of air to the lungs was insured by tracheotomy. As there were no results obtained by these measures the pericardium was opened by an incision through this muscle, which was enlarged till it would admit three fingers. Thus the ventricular portion of the heart could be grasped and compressed rhythmically. Slow contractions were noted after five minutes, and after another five minutes the heart began to beat slowly; the ears and lips, which had previously been quite livid, resumed their normal ruddy appearance; and the tracheal and abdominal wounds bled slightly. Half an hour after the restoration of the beats the heart ceased pulsating. Green further reports a case occurring in the practice of Keetley. The patient died under chloroform. The usual methods of restoration

proved futile. At the end of three-quarters of an hour Mr. Keetley opened the abdomen and compressed the heart in the manner already described, but without result.

Green has collected in all 40 cases, 36 of which have been previously reported. Four methods of operation may be utilized to gain access to the heart:

First, the thoracic method. In this a rectangular flap is cut over the left side of the thorax with the base either outward or inward. The two great objections to this method are that the operation is itself a slow and severe one, and in resecting the ribs there is great danger of injuring the pleura and causing a left pneumothorax, an event which would make restoration of the heart-beat and spontaneous breathing much more difficult to accomplish.

Second, the transdiaphragmatic abdominal route. After opening the abdomen an incision is made passing obliquely from right to left and from before backward, starting slightly in front of the summit of the diaphragm and passing toward the apex of the heart, but not involving it. As soon as the diaphragm is penetrated the remainder of the incision is made with scissors on the finger as a guide.

Third, the subdiaphragmatic route. This is the one most frequently adopted. Through the abdominal incision the surgeon has merely to pass his hand up to the under surface of the diaphragm, through which it is usually quite easy to define the heart and press it up against the posterior surface of the thoracic wall, counter-pressure being made at the same time with the other hand on the exterior of the chest. An opening along the left costal margin seems to allow of freest access. This method has given the best results so far with six complete successes.

Fourth, Crile's method consists in making rhythmical pressure on the chest wall over the heart and the use of Fell O'Dwyer's apparatus for producing artificial respiration, aided by intravenous injection of solutions of adrenalin of strengths varying from 1 in 25,000 to 1 in 50,000, such injection continuing at the rate of 3 cubic centimeters per minute if this is necessary. In addition a rubber suit is applied, which produces an even pressure over the whole body. In this way the blood-pressure is mechanically increased.

Out of forty cases nine are reported as being entirely successful and eight as being partially so—that is, cases in which the pulse and respiration were definitely restored, but which ultimately ended fatally.

Green summarizes the results as follows: (1) It has been possible in human beings to restore the heart-beat by massage when ordinary measures of resuscitation have failed, even when the massage has not been commenced until the heart had been stopped for forty-five minutes, but a definite complete cure has never yet been effected when this interval has been longer than from seven to eight minutes. (2) In many of the cases the adoption of massage for a period of from thirty seconds to five minutes has been sufficient to restore the heart-beat, but it has sometimes been necessary to go on with it for fifteen minutes or even longer. (3) Artificial respiration and its adjuncts must also continuously be applied, and sometimes it is necessary to persevere with it long after pulsation is restored in order to reëstablish the respirations. The kinds of cases in which it may be used with a fair prospect of success are: (1) Cases of primary arrest of the heart in a condition of acute dilatation from poisoning by an overdose of a powerful volatile drug, such as chloroform; (2) cases in which the gradual accumulation of volatile poisons, such as chloroform, leads to primary paralysis of the respiratory and vasomotor centers, followed by stoppage of the heart; (3) cases of asphyxia; and (4) cases of suspension of the functions of the vital centers from simple exhaustion or injury, and consequent stoppage of the heart.

It would seem that the order of procedure in these cases of sudden heart and respiratory failure should be as follows: (1) Immediate lowering of the head and the commencement of artificial respiration and tongue traction, taking care that a free access of air to the lungs is possible, and

therefore implying tracheotomy if necessary. (2) If the abdomen is open, pressure on the abdominal aorta to confine the circulation to the upper part of the body. If it is not open the intravenous injection of adrenalin solution and the application of Crile's rubber suit, or, failing this, tight bandaging of the limbs and abdomen. (3) The subcutaneous or intravenous injection of normal saline solution, partly to raise the blood-pressure and partly to dilute any poisons which may be in the blood and tissues. (4) If the above methods have not been successful after being applied for from eight to ten minutes, heart massage by the subdiaphragmatic method. This route should always be adopted, unless the chest is already opened or to be operated upon, as being the easiest way of access, the one fraught with least danger to the patient and the one which has given the greatest percentages of success. The time is fixed at from eight to ten minutes, because eight minutes is the limit of the interval at which up to the present time a complete success has been obtained in man, and if it is exceeded the danger of the production of fibrillary twitchings, inability to restore consciousness, and the development of spasms in the voluntary muscles, with consequent failure of the manipulations, have to be taken into consideration. The unavoidable extension of this limit should, however, be no bar to the adoption of the method, as very hopeful results have been obtained even when forty-five minutes has elapsed from the onset of the syncope before it has been tried. (5) After normal pulsation has returned to the heart, artificial respiration must be continued until spontaneous breathing has been restored, or until circumstances make it improbable that such restoration will be obtained.

TUBERCULOUS PERITONITIS—WHEN TO OPERATE.

The interesting fact is brought out by GELPKE (*Deutsche Zeitschrift für Chirurgie,* lxxxiv, 4, 1906) that only cases of several weeks' standing should be treated by incision. The only cases of less than six weeks' standing which recover after operation are those characterized by extremely large exudate.

Experiments on animals have shown that removal of the exudate soon after inoculation of the peritoneum has a very bad influence on the course of the disease, and the same is true in man except in cases with unusually profuse exudate. A series of tables collected from various authors shows that of 46 cases operated on within two months of the beginning of the abdominal enlargement only five recovered, and in three of these the large amount of exudate is commented on. Of 79 cases operated on four months or more after the beginning of the ascites all recovered except 12, and of these four died from sepsis or hemorrhage, three were cachectic at the time of operation and died soon after from phthisis, and three of the others showed an exudate with very little fluid and a large amount of caseous matter. Of 43 cases of between two and four months' duration 28 recovered and three died from sepsis. These figures show the folly of operating early. Gelpke believes that the exudate has at first strong bactericidal properties and that it gradually loses these. If it is not replaced by fresh exudate after this the condition grows worse, but if it is drawn off the fresh exudate which takes its place has also strong bactericidal properties and continues the work of healing. If it is drawn before its work is done harm results. Free incision gives better results than simple puncture, but the use of antiseptics, even salt solution, and drainage are to be avoided.

CURETTEMENT WITH LOCAL ANESTHESIA.

In an article on the local use of novococaine BLONDEL (*Revue de Thérapeutique,* No. 23, 1906) states that he can perform curettement of the uterus painlessly if the cavity of the womb is packed for ten minutes with gauze saturated with a five-percent solution of this substance. This does not abolish the reflex contracture of the wall which follows touching the exposed muscle, and which may be disagreeable although not actually painful.

REVIEWS.

THE MEDICAL AND SURGICAL USES OF ELECTRICITY. By A. D. Rockwell, A.M., M.D. New Edition, Revised and Enlarged. E. B. Treat & Company, New York, 1907. Price $5.00.

For many years Dr. Rockwell has been recognized by the American medical profession as being distinctly the leader among electrotherapeutists, and his large experience and constant employment of this remedial agent for the relief of various disorders make anything that he may write or say concerning this subject of more than ordinary interest. The present volume not only deals with medical electricity, as we used to know it, but with the use of the *x*-ray, phototherapy, the Finsen light, vibratory therapeutics, high-frequency currents, and radioactivity. We are informed in the preface that this is practically the eleventh edition of the work, the book having appeared originally under the names of Beard and Rockwell.

There can be no doubt whatever that all of the measures just named afford the physician therapeutic opportunities in the treatment of disease, but there can also be no doubt that many of those who employ electricity most largely for medical purposes exaggerate its value, and believe that it does good in conditions in which the very nature of the condition practically prohibits advantageous results. In other words, our point is that a comparatively small proportion of cases as seen by the general practitioner require the use of any one of these remedial agents for their relief, and, on the other hand, that when these remedial measures are applicable they must be applied by one who has had very large experience in their technique, and who can afford to be possessed of very expensive apparatus.

Dr. Rockwell's book, as we have already pointed out, is, without doubt, the most authoritative book upon this subject which the medical man can purchase. But there are a number of things in it with which we cannot agree, and the mention of which in the text we think seriously detracts from the scientific value of the rest of the work. In some instances the fault lies apparently in a looseness in the use of terms. For example, on page 303 we are told that galvanization is useful in disorders of the "vasomotor nerve," and therefore is of value in some cases of "deficient circulation, cutaneous hyperesthesia, certain diseases of the skin, and exophthalmic goitre." We know of no one vasomotor nerve, and if it existed it is questionable whether its galvanization could produce changes in cutaneous hyperesthesia or diseases of the skin. Again, on page 338, we are told that the object in central galvanization is not only to influence the whole central nervous system, such as "the brain, sympathetics, and spinal cord," but "the pneumogastric and depressor nerve" as well. The depressor nerve is one which exists in the circulatory mechanism of the rabbit, but so far as we know there is no "depressor nerve" (strictly speaking) in the anatomy of the human being. In the rabbit it is a branch of the vagus, and its function, as is well known, is to lower arterial pressure under certain circumstances when this pressure reaches a point which overburdens the heart.

In regard to any attempt to galvanize the brain, we believe that it is quite impossible to pass electricity through the scalp and the skull into the cerebral cortex unless a current is used which is unsafe, and that any effects which follow the application of galvanization or any form of electricity to the vertex are reflex and not direct. The statement that a current passing from the vertex to the epigastrium "traverses the center of life—if life has any center—and affects the sympathetics and the roots of the facial nerves" is probably incorrect, and so general as to possess little value. Why it

should be considered advisable to galvanize the roots of the facial nerve, the brain, and the sympathetics all at once we do not understand. So, too, we doubt whether it is worth while to state, as on page 487, that photophobia dependent on scrofulous inflammation of the cornea in children can be benefited by one to three applications of galvanic electricity. Again, the employment of galvanic electricity in the convalescence of typhomalarial fever is questionable, the more so as clinicians of the present day do not recognize the existence of any such malady. The use of general faradization and central galvanization in conjunction with quinine and iron in the treatment of acute febrile diseases, as on page 521, seems scarcely rational, and the statement that Dr. Glax treated thirty cases of typhoid fever by galvanization of the cervical sympathetics, thereby "reducing the temperature and diminishing the fever" (*sic*), we think is open to grave doubt. Statements of this character, which are antagonistic to modern conceptions of physiology and pathology, mar the quality of the rest of this excellent book, and we hope they will be corrected in the next edition.

AMERICAN PRACTICE OF SURGERY. Editors: Joseph D. Bryant, M.D., and Albert H. Buck, M.D. Complete in Eight Volumes. Illustrated. Volume II. William Wood & Company, New York, 1907.

The second volume of this Surgery has been looked for with some impatience by those whose appetite for more was whetted by the first volume.

James Farquharson Leys contributes the first chapter, entitled "Diseases which Belong in Varying Degrees to the Domain of Surgery, and which are Observed in Certain Parts of the United States and its Dependencies, and in Canada." Under this caption are included leprosy, plague, glanders, anthrax, actinomycosis, mycetoma, rhinopharyngitis mutilans, and scurvy. In regard to leprosy he holds that it certainly is a contagious and infectious disease and suggests that carriers may be mosquitoes, lice, or fleas. He uses the word contagion simply as a term which implies that an affection is directly or indirectly communicable, and notes that the disease is very feebly or mildly contagious.

Bubonic plague has, the author states, in 1894 caused 60,000 deaths in Canton. It is described as primarily and essentially a disease of rats, frequently communicated to other animals and to man. It is communicable by inoculation, by ingestion of infected food, and by inhalation. There is a period of incubation of from two to eight days. The diagnostic test is the discovery of the bacillus in the lymph nodes, blood, sputum, or discharges. As soon as the diagnosis is made Yersin's serum in the dose of 10 to 20 cubic centimeters should be given.

Discussing glanders, the author holds that mallein has no curative effect. Expectant treatment is rather favored for anthrax.

V. P. Gibney writes upon tuberculosis from a surgical standpoint, stating that the tuberculin test has not proven of great value in his hands.

Edward L. Keyes writes upon syphilis from a surgical standpoint, considering infection, immunity, and heredity. As to prognosis he states that he feels justified in telling all syphilitics who come to him in the early stages of the disease, with fair health and without a history of marked alcoholism, that they probably will suffer from their disease for not more than a year, and that they may expect to hear no more of it thereafter, on condition of abstaining from alcohol and submitting to treatment.

Abscess, ulcer, and ulceration are treated in a brief but practical way by August F. Jonas and William McDowell Mastin.

Alfred C. Wood contributes an admirable and scholarly article upon gangrene and gangrenous diseases.

To Douglass W. Montgomery has been assigned surgery of diseases of the skin. In the treatment of furuncle he prizes the

starch poultice, to which is added a heaping teaspoonful of boric acid powder.

Carbuncle is very briefly considered. Mycetoma is again discussed in this chapter and is stated to be incurable. There is also a repetition of subject-matter in the case of glanders and anthrax, nor does post-mortem pustule seem a happy appellation for an infected wound. Cutaneous horn is given a whole page, and similar space is accorded to granuloma coccidioides, whilst carbuncle is accorded very little more.

J. Clark Stewart contributes a section upon surgical diseases and wounds of muscles, tendons and their sheaths, bursæ, fasciæ, and connective tissue. These subjects are scarcely covered with adequate thoroughness for the practical surgeon.

Willard contributes a most excellent article on surgical diseases of nerves, one which can be criticized adversely only because of its brevity.

Dowd's section upon surgical diseases of the lymphatics accentuates the need of wide dissection in the removal of all malignant growths.

Burns and the effects of electric currents and lightning are treated by Benjamin T. Tilton.

Frost-bite is discussed by Paul Monroe Pilcher.

The subject of wounds is covered by Carl R. Darnall and William C. Borden. The latter has contributed a truly admirable article.

As a whole this second volume scarcely equals the high standard set by its predecessor. It appears to deal with general principles rather than their application. The ground is covered in a manner perhaps acceptable and useful to students, but not satisfactory to the practitioner, who wishes to find in a volume of this character not a general résumé of diagnostic teaching, but the individual preference of the writer of the article and his reasons therefor.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.D.

The month's doings include the celebration of the 179th anniversary of the birth of that great pioneer of the scientific study of morbid anatomy, John Hunter, who founded the Museum of the Royal College of Surgeons, which is one of the treasures of London. Mr. H. T. Butlin delivered an oration on the objects of Hunter's life, in the course of which he showed anatomical specimens which had been prepared by Hunter 120 years ago, and were still in excellent preservation. In the evening a dinner was given at the college in Lincoln's Inn Fields, to which a large number of distinguished guests had been invited. The president of the Royal College of Surgeons, Mr. Henry Morris, took the chair, and among those present were Prince Francis of Teck, the Earl of Onslow, Lord Reay, Lord Cheylesmore, Sir Herbert Maxwell, the vice-chancellor of Cambridge University, the principal of London University, the director-general of the medical department of the army, and also of the navy, the president of the Royal College of Physicians, Sir Douglas Powell, and many others well known in various departments of science.

The Royal Commission on Vivisection is proceeding steadily with the examination of witnesses, and assuming that an antivivisectionist is capable of weighing evidence and arriving at a logical conclusion, one might suppose that the antivivisectionist propaganda had already been sufficiently discredited to throw even the energetic secretary of the Antivivisection Society out of employment. Professor

Starling in his evidence pointed out how progress might be retarded by limiting experimentation to direct utilitarian experiments, to the exclusion of investigation where merely an advance of knowledge was sought. He quoted in support of this the first edition of Pearson's "Grammar of Science," in which the researches of Clerk Maxwell and Hertz on electric waves were mentioned as researches which in one's remotest imagination could not be thought to have any direct practical bearing. Before the second edition appeared these apparently useless researches had led to Marconi's discovery of wireless telegraphy. He further pointed out that the present law forbids a student to experiment on a live animal in order to acquire surgical skill; the student's first anesthetic or his first tracheotomy, and equally the surgeon's first performance of some difficult operation on the stomach or intestine, must therefore perforce be carried out on the human subject. A surgeon must acquire skill somehow, and at present he is forced to do it by experimenting on his human patients. Dr. Starling said he could not believe that the framers of the present law regarded the life of animals as more sacred than that of man, but if they would compare the mortality in a surgeon's first ten cases of resections of bowel with that in his second ten cases, they would see what sacrifice of human life was involved by the present law, a law which he considered to be most immoral.

It is not often that questions of public health are made the subject-matter of pulpit appeals, but Father Bernard Vaughan, who has made himself notorious recently by his pulpit denunciations of the sins of the so-called "smart set," has just commenced another series of sermons in which he continues his attack on the iniquities of "society." In the first of these delivered a few days ago he denounced the modern fashion whereby England was competing with France for the lowest birth-rate in Europe, and he protested against the selfishness of the fashionable woman who, to save herself trouble, feeds her offspring on "concoctions in a bottle" instead of giving it the food which nature has provided. Such practices set but a poor example to the poorer classes, and are the cause of a grave increase in the mortality amongst the ever-decreasing number of children born in this country.

A meeting has just been held at the Royal College of Physicians to decide finally upon the name of the new society which has been formed by the amalgamation of the Royal Medical and Chirurgical Society, the Pathological Society, the Obstetrical and Gynecological Societies, the Neurological, Laryngological, Odontological, and Dermatological Societies. Three names were submitted to the meeting, but the choice lay between "Royal Academy of Medicine" and "Royal Society of Medicine." The latter was finally decided upon by a small majority.

The daily papers have been doing their best for the last few weeks to raise a scare on account of some cases of cerebro-spinal meningitis which have occurred in Scotland. The picturesque name "spotted fever" evidently catches the lay mind; and the fact that a few cases, perhaps no more than might be counted in any year at this season, have occurred in London has added fuel to the flame of sensational report.

A paper was read by Dr. Leonard Guthrie at the Society of Anesthetists this month on those cases in which death occurs soon after administration of an anesthetic, particularly chloroform or ether. Considerable interest was aroused by Dr. Guthrie's publication of several such cases four years ago, and another series still earlier. He came to the conclusion that some sort of autointoxication occurred, as a result of which death took place within ten hours to six days after the anesthetic. This fatal issue was not related to any severity of the operation, but to an intense fatty degeneration or fatty infiltra-

tion of the liver, which allowed the accumulation of toxic substances in the system; and if the kidneys happened to be the seat of disease death was still more likely to occur, for the elimination of the toxic substances was hindered. He now considers that the condition of the liver is not induced entirely by the anesthetic, but was present before, and that the fatty acid intoxication due to the preëxisting state of the liver is increased by the action of the anesthetic on the liver. He thought the condition produced is akin to cyclic vomiting and diabetic coma, in which some acid intoxication is almost certainly present, and the urine contains acetone; this latter feature is observed in the cases of chloroform poisoning. Dr. H. D. Rolleston pointed out that the patient is starved before an operation, and is apt to vomit and be still further starved after operation, and these are undoubtedly possible factors in the causation of acetonuria quite apart from the action of chloroform. The subject is one of great practical interest; it suggests the need for careful attention to the *prima viæ* whereby elimination may be promoted both before and after anesthetics. But, as might be expected, the anesthetists were not going to hear chloroform condemned on insufficient evidence, and Dr. Dudley Buxton, whose large experience as an anesthetist entitled his opinion to much weight, objected to the term "chloroform poisoning" in these cases, for it is not proved, he said, that the symptoms or the fatal result are due to the chloroform.

The Pathological Society at its meeting a few days ago devoted the whole evening to a consideration of the parathyroid glands. These minute masses of glandular tissue which are found in the tissues near the thyroid, though sometimes even in the mediastinum, to the number of ten or twelve, but in varying numbers in different individuals, are so small that they are only to be found on careful search usually, and their nature is to be verified with the microscope, not with the naked eye. It is uncertain whether they produce an internal secretion like that of the thyroid gland, but there is evidence that they are of practical clinical importance: some experimenters have found that in animals the removal of these tiny structures produces death within a few days, and one observer found that implantation of one of these little glands in a case of myxedema produced marked improvement.

All Cambridge graduates will be pleased that the honorable post of Principal of the Glasgow University should have been conferred on Dr. Donald Macalister, who has been so familiar a figure to generations of students at Cambridge. A generation at Cambridge is a triennium; I do not mean to imply that Dr. Donald Macalister is a Methuselah, or even a Nestor—indeed, he is hale and vigorous and likely to do good work for Glasgow University.

But if Cambridge can spare its distinguished alumni to fill important posts in other parts of the kingdom, it can ill afford to lose them by death, and there are few whose fame has been so world-wide as was that of Sir Michael Foster, who has passed away since my last letter. Those who graduated in medicine five-and-twenty years ago will always remember him as one of the great teachers of science in Cambridge at that time, with Sir George Paget and Sir George Humphry. In later years he had given less time to physiology and more to parliamentary work, and his office of secretary to the Royal Society, and his active part in the Royal Commission on Tuberculosis and many other outside duties had removed him to a great extent from the sphere of physiological investigation, but it is as a physiologist that he will be remembered in years to come.